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A FACTOR ANALYSIS OF PERSONNEL SELECTION DATA: Intra- and Inter-Area Relationships of Biochemical, Physiological, Psychological, and Anthropometric Measures

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Bureau of Medicine and Surgery, Navy Department
Task MR005.14-2101

SEMPER FIDELIS

CAMP LEJEUNE NORTH CAROLINA

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SUMMARY PAGE

THE PROBLEM

To examine (1) the feasibility of employing hormone and blood responses during stressful situations to classify service personnel for military specialties, and (2) the interrelationship of these data and a variety of physiological, psychological, and anthropometric measures.

FINDINGS

Taking difficult written examinations and undergoing routine training procedures at the submarine escape training tank were sufficiently stressful to enlisted submarine candidates to result in 17-ketosteroid and blood lymphocyte changes. In general, there was an increase in 17-ketosteroids and a decrease in lymphocytes. The greatest hormonal output occurred in the pre-stress sample as subjects anticipated the task. In addition, certain physiological responses to exercise (pulse rate in recovery, basic height of blood pressure, and variability in blood pressure levels) were considered as furnishing the basis for meaningful classification of individuals. Personality inventories hold promise for identifying the personality "quirks" of normal individuals, and somewhat the same personality patterns were suggested by various Rorschach scores. There was evidence of a relationship between personality traits and performance on intelligence and aptitude tests and a rather obvious lack of agreement in the way two interviewers reacted to the subjects.

APPLICATION

Responses of the body's fundamental alarm mechanisms are considered a reliable measure of individual differences. The study offers a lead for evaluating and systematizing fitness estimates so that test scores will give more emphasis to factors holding the most promise for meaningful classification of individuals. The anthropometric data are helpful in designing special equipment, particularly where man-machine relationships are vital. Moreover, in collaboration with paper and pencil tests (personal inventories, intelligence and aptitude tests), they serve to indicate the relationship between body type, physiological constitution, and personality patterns.

ADMINISTRATIVE INFORMATION

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This restriction will be removed and the report may be released on 15 February 1962.

ABSTRACT

Tests used in routine screening, together with special additional measures, were administered to 120 randomly selected enlisted submarine candidates under carefully controlled conditions. The 362 variables included data from the biochemical, psychological, psychiatric, physiological, anthropometrical, and physical examination fields. In order to render the data manageable, they were divided into a number of sub-studies and factors analyzed by the Thurstone Group Centroid method. Selected factors from each sub-study were then combined to determine inter-area relationships. As the end product of the elaborate statistical analysis, seven factors were extracted which explained more than 90 per cent of the total variance. Two of these were related to the reaction of 17-ketosteroids during stressful situations, and another was designated as a size-strength factor with masculinity overtones. The cluster of loadings on one extracted factor was suggestive of the type of individual who thinks with his heart rather than his head while loadings on another factor were considered characteristic of the person who thinks with his head rather than his heart. Still another factor was designated as orientation in environment. Finally, there was a poorly defined factor vaguely suggestive of hormonal response.

A replication on another population is, of course, necessary before estimates are possible regarding the effectiveness of any of the factors in predicting successful performance or classifying individuals for a particular task. It is recommended that the number of variables employed in such a study be much smaller in order that more clear-cut factors will emerge.

Data for the various area studies are appended in sufficient detail to permit additional investigations by interested specialists. These include material on the biochemistry of nervous stability; co-relational relationships of the various white blood cells in healthy male adults; physical fitness, anthropometric and somatotyping measures; two independent scorings of the Rorschach ink-blot test; personal interviews given each subject separately by two interviewers, and several psychological tests employed in selection.

FOREWORD

The study reported here represented a unique opportunity for evaluating measures from a variety of subject matter fields on the same population. The intent was to establish a small battery of relatively independent tests, each holding promise for predicting performance, and to validate them on a subsequent group. While the subjects of the study were submarine enlisted candidates, the variables under study were considered applicable to selection problems in other Navy specialties, as well as in the Marine Corps, the Army, the Air Force, and possibly, industry as well.

The experimental phase of the study was conducted in 1946 and proceeded smoothly; the analytical phase proved much more difficult. In addition to the loss of many key staff members through demobilization, there was the problem of selecting an analysis which would reduce the formidable array of data to workable size and demonstrate interrelationships of items from the various subject matter fields. When factor analysis was chosen as the most appropriate statistical tool for the task, unskilled personnel had to be trained in the precise and time-consuming procedures required by the analysis.

It was not until the spring of 1949 that there appeared the initial report of what was to be a series culminating in a summary of the inter-area relationships. Statistical computations on some of the area studies awaited only final "polishing" before their results could be written up. At this crucial stage, the project was terminated and the author was transferred and assigned to other duties. He managed to publish three area studies in scientific journals before the press of other work became too great to continue.

In the intervening years, there has been a small but gratifyingly steady stream of requests for reports on the study, not only from various sections of the United States but from England and Canada as well.

Recently funds were made available for completion of the computational work, thus enabling publication of area studies and a summary of inter-area relationships.

It is truly unfortunate that the primary value of the study was lost because the tests were not validated on another population nor were follow-up studies made of the actual performance of the candidates in submarines. Nevertheless, the area studies reported here will be of value for other investigators in providing comparison populations. It is hoped that they will also stimulate further research in areas holding promise of predictive value in selection.

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INTRODUCTION

Despite extensive preliminary screening at other activities before reporting to New London, Connecticut for submarine training, enlisted candidates were eliminated at three later stages: during processing at the Medical Research Laboratory, during the course of 8 weeks of basic training at the Submarine School, and during a 6-month trial period aboard submarines. Elimination of candidates as psychologically unsuited for submarine service occurred principally during the first stage and was based largely upon the results of a personal interview conducted by a submarine medical officer.

It is a generally accepted fact that employing subjective techniques to evaluate the intermediate group between the two extremes of any population inevitably results in the admission of some inept individuals and in the disqualification of others who might have proved successful. This danger rises sharply during periods of expansion, such as mobilization, when sufficient numbers of highly trained interviewers with actual submarine experience are not available. Moreover, in the submarine service, additional burdens are placed on the selection program by continuous technical developments in underwater craft and the new problems of adjustment these create for the crew.

In an attempt to find a more objective measure of a man's ability to withstand tension and strain, it was proposed to study certain fundamental alarm response mechanisms of the body during situations considered to cause stress. Work by other investigators had shown promise in this area. The Dougherty and White studies involving 17-ketosteroid and blood lymphocyte responses in animals (1) were carried forward on human subjects by Hoagland, Pincus, and their associates at the Worcester Foundation for Experimental Biology. This group found an enhancement of the output of 17-ketosteroid substances by normal persons in response to a wide variety of stresses - exposure to heat, to cold, to anoxia, to fatiguing pursuit meter tasks, and to difficult written examinations (2-6). Their studies for the Air Force indicated not only that the stresses of flying were reflected in the urinary excretion from the adrenal cortex but also that the 17-ketosteroid output of pilots correlated positively and significantly with their superior officer's rating of their fatiguability (7). Inversely, their observations indicated a decrease in lymphocytes in normal persons in response to a wide variety of psychological stresses.

In contrast, the output of the hormonal metabolites during stress was greatly reduced or absent in the case of psychotics whereas their lymphocyte counts rose during stress. This failure of fundamental

alarm response mechanisms in the latter group is noteworthy since psychotics are persons who have broken under the particular stresses of their daily lives.

Since such studies held promise for the meaningful classification of individuals faced with the exacting emotional strains of modern warfare, it was proposed to study 17-ketosteroid and lymphocyte changes occurring while subjects took difficult written examinations (the psychological stress situation) and underwent training in the Submarine Escape Training Tank (the tank stress situation).

Later it was decided to add other tests which were of general interest in selection (e.g., estimates of strength, endurance, psychological normality, and several estimates of the trait of masculinity) so that data from several subject matter fields would be available on the same population.

METHOD AND PROCEDURE

Population

The subjects in this study were 120 naval enlisted personnel ranging in age from 17 to 26 years. They were selected at random from 800 Submarine School candidates at the Submarine Base, New London, Connecticut.

In the course of an indoctrination lecture by the officer-in-charge of the laboratory, these men were informed that they had been chosen to serve as subjects in an experiment for a 3-day period, impressed with the necessity of complete cooperation during the testing period, and promised compensatory liberty. All subjects were given the opportunity of withdrawing from the experiment; two did so and volunteer substitutes were found. With very few exceptions, the men were highly motivated since all desired submarine duty and felt that failure on any of the tests administered would disqualify them for Submarine School.

Strict regimentation of the subjects was maintained during their 3-day testing period. One section of the laboratory was set aside as barracks space, and a separate mess was provided. A chief hospitalman was assigned as Master-at-Arms to supervise the groups and maintain the schedule.

Two groups of six subjects were studied each week; the first group was selected on a Monday morning and the second on Wednesday morning. The schedule for each group was identical, with the exception that the Group Rorschach (discussed in detail later) was administered to both sections simultaneously on Wednesday afternoon.

Experimental Schedule

The complete experimental schedule included not only the variables added for the purpose of this study but also all tests routinely administered to submarine enlisted candidates. This schedule is shown below; tests employed in routine screening are indicated by an asterisk.

First Day

0745	Report to classroom
0800-0900	*Visual evaluation for radar watches *Psycho-acoustic evaluation for sonar watches Call personnel office for subject's GCT grades**
0900-0930	Motivation lecture
0930-1145	*Personal interviews *Vision tests *Color vision tests *Audition tests *Ear, nose and throat examination
1145-1230	Lunch
1230-1300	Assignment of bunks and lockers
1300-1415	*X-ray of chest *Dental examination
1415-1515	Hand Dynamometer test, anthropometric measurements, and (if necessary) completion of *personal interviews

** The General Classification Test (GCT) was not given during the experimental period, but the marks were obtained from the service records of the subjects and used as an additional variable.

1515-1530	Rest period prior to physical fitness test
1530-1630	Physical fitness test
1700	Dinner
2200	Urinate and discard
2215	Retire

Second Day

0600	Reveille: Collection of urine and blood specimens (Basal)
0645-0745	Breakfast
0745-0800	Rest period
0800	Collection of urine and blood specimens (Pre Stress)
0830-1045	Officers Classification Test (Psychological Stress) *Navy Enlisted Personal Inventory (Personal History, Medical History) Minnesota-Multiphasic Personality Inventory
1045-1100	Rest period
1100	Collection of urine and blood specimens (Stress)
1130-1215	Lunch
1230-1245	Collection of urine and blood specimens (Post Stress)
1300-1500	*Physical examination Somatotyping photographs
1500	Rest period prior to physical fitness test
1500-1700	Physical fitness test
1700	Dinner
2200	Urinate and discard
2215	Retire

Third Day

0600	Reveille: Collection of urine and blood specimens (Basal)
0645-0745	Breakfast
0745-0800	Rest period at Submarine Escape Training Tank
0800	Collection of urine and blood specimens at training tank (Pre Stress)
0800-1100	*Submarine Escape Tank Training (Tank Stress) (Subjects seated for 15 minutes rest immediately after completion of training)
1100	Collection of urine and blood specimens (Stress)
1115-1230	Lunch
1230-1245	Rest period
1245	Collection of urine and blood specimens (Post Stress)
1300-1415	Group Rorschach (both groups)
1415-1430	Rest period prior to physical fitness test
1430-1700	Physical fitness test**
1700	Dismissed

The tests from which data were utilized in this study are described below. Additional details are available in the appendices which present results of the area studies separately.

** The group which completed its experimental period on Wednesday afternoon and the group which started its session on Wednesday morning each took the physical fitness test allotted it according to the randomized schedule.

The Psychological Stress Situation

This consisted of the administration of the short group form of the Minnesota Multiphasic Personality Inventory (MMPI), the Navy Enlisted Personal Inventory (PI), and the Officers Classification Test (OCT).

The MMPI is a psychometric instrument developed to assist psychologists and other personnel workers who must deal with personality difficulties among more nearly normal persons rather than with the obvious abnormalities with which psychiatry is concerned (8).

The PI consisted of Form 2 of the Personal Inventory (9), a group test which presents a standardized psychiatric interview in pencil and paper form.

The OCT is a battery of aptitude tests designed to measure verbal ability, mechanical comprehension, mechanical and electrical information, mechanical ability and spatial perception (10).

The customary time was permitted for completion of the MMPI and the PI, and the personal nature of the questions asked was relied upon to produce stress. The OCT was regarded as beyond the general ability of most enlisted candidates, and, in an attempt to increase stress effects, less than half the period usually given for its completion was allowed. Additional tension was provided during the tests by periodically announcing the sections which should have been completed by that particular time interval.

The Tank Stress Situation

This consisted of the routine training procedures undergone by submarine enlisted candidates at the Submarine Escape Training Tank in force during 1946. This device, intended to acquaint personnel with the method of escaping from a submerged submarine which is unable to rise to the surface, is a tower containing a column of fresh water 25 feet in diameter and 100 feet deep. A training bell permits an ascent from any desired depth, and hatches, or locks, are located at depths of 18, 50 and 100 feet.

As a preliminary check on their ability to take pressure, the subjects entered a dry recompression chamber where they were given

50 pounds of pressure (3.4 atmospheres) in from 6-10 minutes. Each man was then examined by a qualified otologist for ear damage (11). Men who passed this inspection were instructed in the use of the Momson lung, an inflatable device containing a chemical carbon dioxide absorbent which enables the user to breathe freely while under water. Then each man made two escapes from the training bell at 12 feet, and two escapes from each of the 18- and 50-foot locks.

Procedure

One stress situation was given each morning of the second and third experimental days. For the first 13 groups the psychological stress was given initially and the tank stress secondly. The order was reversed for the remaining seven groups since preliminary analysis of the data suggested that possibly the tank training produced physical fatigue which might be reflected in lower physical fitness test scores for that day.

During the course of each stress situation, four urine and blood samples were taken by two chief hospital corpsmen:

(1) The basal - the first sample collected upon arising (approximately 0600)*

(2) The pre-stress - taken 15 minutes before stress began (approximately 0800)

(3) The stress - taken 15 minutes after the stress (approximately 1100)

(4) The post-stress - taken 2 hours after the stress (approximately 1245).

The urine specimens were forwarded daily to the Worcester Foundation for Experimental Biology located at Shrewsbury, Massachusetts, in special sealed containers for 17-ketosteroid analysis (12, 13). An aliquot of 500 cc was sent for each subject for each sample, and the total volume excreted was recorded on the specimen container. Two or

*In the evening of each experimental day, care was taken to ensure that all subjects emptied their bladders completely before retiring to avoid contamination of the next day's basal ketosteroid sample.

three drops of toluene were added to each jar as a preservative. The amount of creatinine in the urine was determined as a check on the samples taken, and androgens were extracted for possible points of interest related to changing 17-ketosteroid output.

The blood samples taken concurrently with the urine specimens were subjected to a complete differential leucocyte count and hemoglobin determination. These procedures were carried out at the Medical Research Laboratory by two chief hospital corpsmen, according to the method of Beck (14).

Strength and Endurance Data

Physical Fitness Tests

Navy Step-Up Test. Developed by members of the Experimental Diving Unit, Washington, D. C. (15) and employed in the selection of candidates for Deep-Diving School, this test has two distinct components:

(a) The cardiovascular phase consists of 20 step-ups in 30 seconds on a stool 18 inches high. The resting pulse is counted prior to the exercise, and pulse rate counts are taken during the periods 5-20 seconds and 105-135 seconds after completion of the step-ups. The cardiovascular score is computed as the total of the two post-exercise pulse rates. This scoring method provides a range of values between 54 (good) and 90 (poor), or a difference of 36 heart beats for interpreting scores.

(b) The endurance phase consists of the same exercise as in phase (a) but continued until exhaustion or loss of pace forces cessation. As an aid to uniform motivation in this study, the medical officers administering the tests established a 5-minute cut-off point. The pulse rate was counted during the 5-20-second period following the endurance run. Although in actual use, a post-endurance pulse rate under 140 is considered inconsistent with maximum effort, the score for phase (b) is recorded simply as the endurance time in seconds, and the minimum satisfactory score is 60 seconds (15). In practice, it is recommended that phase (a) be used for frequent fitness checks and phase (b) only occasionally.

Harvard Step-Up Test. This test which has been introduced into the training program of the Army, Navy and Air Force consists of 30 step-ups in 60 seconds on a stepping platform 20 inches high for a period of 5 minutes. In addition to the customary post-exercise pulse measures (1-1.5, 2-2.5, and 3-3.5 minutes following the endurance

run), the 5-20-second pulse rate following the exercise was taken for purposes of this study. However, the score was computed according to the prescribed formula (16):

$$\text{Score} = \frac{\text{duration of exercise in seconds} \times 100}{2 \times \text{sum of pulse counts } 1\text{-}1.5,\ 2\text{-}2.5,\ 3\text{-}3.5 \text{ min. in recovery}}$$

For military purposes, Harvard suggests (16) the following interpretation of scores: below 55 indicates poor physical condition; 55-64, low average; 65-79, average; 80-89, good; and 90 plus, excellent.

Schneider Index of Physical Fitness. One of the earliest of the comprehensive cardiovascular tests, the Schneider has remained popular with the Navy and Air Force and is coming into increasing use by civilian airlines as part of their pilot fitness programs. It consists of 5 step-ups in 15 seconds on a stool 18.5 inches high. Many pulse and blood pressure counts are taken (17) and the final score is the algebraic sum of values given the following separate points: reclining pulse rate, pulse rate increase on standing, standing pulse rate, pulse rate immediately after exercise, return of pulse rate to standing normal after exercise, and systolic pressure standing compared with reclining.

The Medical Department of the Navy regards a score of 7 or less as disqualifying for flight-training candidates if the score remains at this point after repeated administration of the test (18). Further, systolic blood pressure which persistently exceeds 135 mm and a diastolic pressure constantly in excess of 90 mm are unacceptable (18).

Administration. One of three physical fitness tests was given to the men on each of the three experimental days; these were randomized and administered under the direct supervision of the project medical officers.

Although it has been indicated that men make higher scores when physical fitness tests are given immediately after arising (19-21), unfortunately the experimental schedule did not permit their administration under such basal conditions. Instead, they were conducted uniformly approximately 4 hours after a light noon meal at which no coffee was allowed. There was no strenuous exercise in the afternoon, nor was smoking permitted between the noon meal and the completion of a fitness test. The men rested quietly for 15 minutes prior to each test while the administrators explained the procedures to be followed.

Since it was not feasible to avoid competition, this was put to use although never emphasized. Thus, although the physical fitness

tests were administered to a man individually, they were carried out in the presence of the rest of his group. Endurance times and other information were reported to the recorder with no attempt at concealment of results.

Hand Dynamometer

Dynamometers have been employed to assess various aspects of muscular strength for more than 50 years, and a test of hand strength was added to this study for its possible relation to the fitness tests. A Smedley dynamometer was employed according to the technique of Fisher and Birren (22). The essential characteristic of the procedure is that the subject squeezes on the dynamometer at regular intervals, increasing the force exerted by a constant increment (3 kilograms) until he can no longer achieve the required level of performance. After a man fails to reach a given level twice in succession, his score is read in 1-kilogram units as the highest number attained. No interpretation is attached to any single numerical score per se.

In this study, the hand dynamometer test was given in the early afternoon of the first day. Right- and left-hand scores were recorded as separate variables. In the case of a single test administration, as in this study, an individual dynamometer score would require interpretation only if there were a marked difference between scores obtained for the right and left hands.

Psychological Test Data

The MMPI and PI

As indicated earlier, taking the short group form of the Minnesota Multiphasic Personality Inventory and the Navy Enlisted Personal Inventory comprised part of the psychological stress situation utilized in the body chemistry studies. Subject responses were included in the psychological test data.

The MMPI is designed to provide scores on all the more important phases of personality (23-27). It has been used extensively for the overall differentiation of normals from abnormals or persons predisposed to abnormal developments (28-34).

The forced-choice type items which comprise the Navy Enlisted Personal Inventory are based on case history dissimilarities between

psychiatrically undesirable and normal military personnel (35-37). Inasmuch as individual interviews must necessarily be brief during large-scale selection programs, the PI serves as a rough screening device to guide the psychiatrist in orienting his interview. Scores on the two sections (personal history and medical history) were treated as separate variables.

Two-Hand Coordination Test

This is a motor pursuit task which has been employed frequently in the selection of military personnel (38-43). The essential psychological principle involves the carrying out of two coordinated movements simultaneously so that there is a conflict of attention. The subject is rated on his ability to manipulate hand cranks in such a way as to keep a small button in continuous contact with an irregularly moving disc. An electrically operated stop clock measures the total amount of time during which actual contact is maintained. Two 1-minute trials were used.

Basic Battery of Written Tests

The basic battery of written tests consists of a test of arithmetical reasoning (fractions, percentages, proportions, etc.), mechanical and electrical knowledge (picture identification tests), mechanical aptitude (simple principles of physics - levers, pulleys, braces, etc.), and the General Classification Test (verbal abilities). These are standard Navy tests for enlisted men (44, 45). In order to qualify for Submarine School during 1945-1946, enlisted men had to have a combined score of 100 on the GCT and arithmetic tests (46).

These aptitude tests were not administered during the study, but the marks of the subjects were obtained from their service records and used as an additional variable.

Evaluation of Tank Performance

While subjects underwent escape procedures in the training tank (p. 6), their overall performance was rated by a submarine medical officer. The rating included such items as evidence of apprehension, quickness of response to instructions, errors of position on the line, "freezing" on the line, fighting to get out of the water too quickly, and so forth.

Personal Interview

Each candidate for the Submarine School at New London, Connecticut, enlisted or officer, is given a personal interview prior to admission. The comparative smallness of the Submarine Force (even at the height of its strength in World War II, this branch of the naval service comprised only 2% of the total naval population) and the extra care required in selecting submarine crew members has been considered sufficient justification for continuation of the individual interview. The policy was to keep the interview as casual and informal as possible, and to this end, no stipulated form was recommended.

For purposes of this study, however, the interviews were more protracted and more definitely delineated than during routine screening. Each interviewer talked with each subject for approximately 15 minutes, and, using a 5-point scale, rated him on 19 factors selected by the laboratory psychiatrist as containing an evaluation of the personality traits of the individual and his own and family background. These included: (1) appearance and manner, (2) assuredness or uncertainty, (3) motivation or ambition, (4) family history, (5) illness, (6) emancipation from home, (7) psychological and social maturity, (8) interest in activities (hobbies), (9) smoking and use of alcohol, (10) school and job activities, (11) leadership, (12) participation in athletics, (13) attitude toward rough sports, (14) evidence of depression (moods), (15) emotionality - stable or excitable, (16) evidence of apprehension, (17) evidence of chronic tension or active anxiety, (18) presence of concomitants of anxiety, (19) physical fear. Each interviewer was free to make his judgments within the brief guide lines provided by the psychiatrist. The examiners were asked to orient the interview in order to estimate (a) an individual's ability to face stress situations successfully, and (b) the degree of masculinity (or feminity) of an individual. Thus, in addition to assigning points for each item and a total score for each subject, the interviewers tabulated (a) the stress score (the sums of items 1, 2, 4, 5, 14, 15, 17, 18, and 19),* and (b) the masculinity score (the sum of items 1, 2, 3, 6, 7, 8, 9, 10, 11, 12, and 13).* At the time of interview, no data were available on the men other than their GCT scores.

A word concerning the interviewers is in order. Interviewer (E) was a man with no formal training in psychology; he had entered

*Items comprising the stress and masculinity scores were selected arbitrarily by the laboratory psychiatrist.

the Navy at the age of 17 years, and some 20 years later during the wartime shortage of trained personnel, had assisted in the screening of submarine candidates by personally interviewing the applicants. This experience had earned him a reputation for remarkable astuteness in "sizing up" men. Interviewer (K) was a practicing psychiatrist with a background of experience in state mental hospital work prior to his entry into the Naval Reserve.

Group Rorschach Test

The Group Rorschach inkblot test of personality was administered to all subjects by the laboratory psychiatrist. The 10 inkblot characters were exposed on a screen by lantern slides and the subjects were permitted 3 minutes to study the slides and record their answers in a special booklet designed for this purpose.* Following this 3-minute period, the lights were turned on and the slides reshown for a period of 2 minutes during which time the subjects checked their answers and placed them in the various subdivisions, i.e., shape, color, movement and texture. Upon completion of the Group tests, the laboratory psychiatrist reviewed the record with each subject individually in order to clarify any of the responses made.

These tests were scored by the inspection technique developed by Monroe (47). The resultant number represented the summation of the checks given for each scored Rorschach record. In addition to recording the standard scoring of the test, the laboratory psychiatrist completed a special neurotic score as evidence of emotional stress. This was accomplished by adding the checks for those elements of the Rorschach test reported by several Rorschach workers as being significant for the diagnosis of a neurotic personality (48-51). These items included (1) color shock, (2) shading shock, (3) refusal or rejection of a card, (4) form per cent greater than 50, (5) animal per cent greater than 50, (6) FC of one or less, (7) number of M of one or less, (8) number of responses of not more than 25, (9) increase in m, (10) increase in k, K, and c, (11) large number of d, and (12) dysphoric use of achromatic color.

An additional interpretation of the Rorschach records was made by an experienced clinical psychologist. This individual had absolutely no contact with the subjects and had only the recorded responses

* These booklets were arranged by and obtainable from M. R. Harrower-Erickson, 652 East Gorham Street, Madison 3, Wisconsin.

to the various inkblots upon which to base any interpretation. This scorer also independently developed a stress tolerance check list; a maximum of 16 checks could be obtained from a severely stressed individual, with the number of checks received being inversely related to the degree of stress evidenced.

Physical Examination and Anthropometric Data

The complete physical examination given routinely to all submarine candidates was utilized in this study by recording the results, both by the usual verbal descriptions and by rating the various items on a 4- or 5-point scale on special forms prepared for these purposes.

Two of the medical officers assigned to the study were trained by a physical anthropologist from the Harvard University Grant Study in the proper methods of making certain anthropometric measurements. In addition, especially posed photographs (frontal, dorsal and profile views) were obtained for each subject; from these, additional anthropometric measurements were made in order to somatotype each individual. These procedures were made in accordance with the information given in reference (52). An estimate of masculinity was made from both the anthropometric and physical examination data.

Statistical Analysis of Data*

Phase I

In all, 362 measures were obtained. Inasmuch as this study was designed to investigate the interrelationships among the measurements taken, the statistic best adapted for this purpose was the correlation coefficient, which indicates the degree and direction of relationship

*This somewhat artificial division into two phases is employed to distinguish the data analyzed by 1949 (Phase I) under the direction of the project's statistical consultant, Dr. Robert J. Wherry of Ohio State University, and the final computations done in 1961 (Phase II) at the Institute of Statistics of the University of North Carolina at Raleigh, N. C. under the direction of Dr. Arnold Grandage. Both phases employed the Thurstone Group Centroid method to extract the factors (53). In Phase I, the factors were rotated by the method developed by statisticians of the Personnel Research Section, Adjutant General's Office, Department of the Army (54) and in Phase II, rotation was by the quartimax method (55).

between two variables. However, if every pair of relationships between the 362 measurements were studied in turn, there would be (362 x 361)/2 or 65,341 such coefficients to compute and evaluate. Many such comparisons were of little interest and their computation would entail needless time and effort. Therefore, the 362 variables were broken into natural sub-divisions, enabling a more meaningful presentation of results by indicating the basically different yet reliable types of measurements within each group, and finally, the inter-area relationships. Several outstanding statisticians were consulted, together with experts in each of the special subject matter fields. The basic measurements were divided into 8 groups, 3 of which again were sub-divided, making a total of 13 sub-sets of data, each containing from 20 to 47 possibly overlapping and possibly independent measurements from a relatively homogeneous subject matter area. The kind and number of variables selected for each area study were:

17-Ketosteroid Data

	No. of Variables
17-Ketosteroid values	8
Creatinine values	8
Additional tests	4
Total...	20

Blood Data

(a) Comparison of actual counts for differential leucocyte determinations for both psychological and tank stress (Blood Count Study No. 1)

	No. of Variables
Polymorphonuclear leucocytes	8
Eosinophils	8
Basophils	8
Monocytes	8
Total...	32

(b) Comparison of leucocyte and lymphocyte counts (Blood Count Study No. 2)

	No. of Variables
Leucocyte count	8
Lymphocyte count	8
Lymphocyte count (per cent of total leucocyte count)	8
Total...	24

(c) Differential leucocyte comparison (Blood Count Study No. 3)

	No. of Variables
Polymorphonuclear leucocytes	8
Eosinophils	8
Basophils	8
Monocytes	8
Total...	32

(d) Comparison of ratios for both leucocytes and lymphocytes for the psychological and tank stresses (Blood Count Study No. 4)

	No. of Variables
Leucocyte ratios - psychological stress	5
Leucocyte ratios - tank stress	5
Lymphocyte ratios - psychological stress	5
Lymphocyte ratios - tank stress	5
Total...	20

(e) Comparison of ratios for differential leucocyte counts for both psychological and tank stress (Blood Count Study No. 5)

	No. of Variables
Polymorphonuclear ratios - psychological	3
Polymorphonuclear ratios - tank	3
Eosinophil ratios - psychological	3
Eosinophil ratios - tank	3
Basophil ratios - psychological	3
Basophil ratios - tank	3
Monocyte ratios - psychological	3
Monocyte ratios - tank	3
Total...	24

Physical Fitness

	No. of Variables
Navy Step-Up Test	6
Harvard Step-Up Test	8
Schneider Test	17
Hand Dynamometer	2
Miscellaneous (age, body surface area)	2
Total...	35

Psychological Test Data

	No. of Variables
Minnesota Multiphasic Personality Inventory	11
GCT items	5
Evaluation of Tank Performance	1
Two-Hand Coordination Test	1
Navy Enlisted Personal Inventory	2
Total...	20

Personal Interview

	No. of Variables
Interviewer E	19
Interviewer K	19
Composite Scores E	3
Composite Scores K	3
Masculinity Estimate - Grant Study	1
Masculinity Component - Physical Exam	1
Age in months	1
Total...	47

Rorschach Data

	No. of Variables
(a) Rorschach (K)*	
General items	11
Selected items	7
Selected stress items	8
Total...	26
(b) Rorschach (S)*	
General items	2
Selected items	17
Selected stress items	1
Total...	20

Physical Characteristics

	No. of Variables
General physical ratings	25
Age in months	1
Total...	26

* (K) and (S) represent two independent scorings of the same records.

Anthropometric Data

	No. of Variables
Somatotype ratings	20
Anthropometric measurements	13
Masculinity estimate	1
Disproportions and age	2
Total...	36

Correlation coefficients were obtained for all of the measurements in each area. These provided the basic measures for factor analysis, a statistical technique which explains all the relationships in terms of a relatively small number of factors. The rationale for employing the technique for this study is discussed in reference 56.

Results of a factorial study give a factor loading for each original measurement on each of the factors isolated. The per cent of influence explained by each factor in any particular case is obtained by squaring the factor loading. In this study, a factor loading of 0.20 or higher is regarded as significant.

Factor loadings never summate exactly to unity due to small chance errors* in the original measurements themselves. The remainders are presented as residual tables. Inspection of these residuals enables the reader to evaluate the thoroughness and effectiveness of the factor analysis and the purity or spuriousness of the original correlations.

The labeling of a factor is a matter of interpretive judgment rather than a problem in statistics. The designation is assigned on the basis of some property or traits judged to be present in all and only in those tests having loadings on the given factor or reference axis. Insofar as the factor loadings reproduce the correlation coefficients, their mathematical accuracy and certainly their existence cannot be denied, but the name or label assigned is always open to question. While the author has used his best judgment in identifying the factors, the reader is invited to consider and suggest alternate names.

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* Under "chance errors" are subsumed all irrelevant influences, both psychological (fluctuations in interest and attention, shifts in emotional attitude, differential effects of memory and practice) and environmental (distractions, noises, interruptions, and so forth).

The success of the technique employed in Phase I and the soundness of the basic data are both attested by the uniformly low and balanced tables or residuals which are found in the area studies.

Phase II

As a result of the analysis described above, the 362 original variables were reduced to a total of 164 for subsequent study. Variables which had no variation were deleted and where redundant variables were found, those judged most meaningful were retained.

Only 88 of the 120 subjects had complete records on the 164 variables selected for further study. The data for these 88 men were key-punched into cards and the variables divided in four sets. Means, variances and correlations were computed for these sets. A total of 33 factors was extracted by the centroid method from those four correlational matrices. In each case, more than 90 per cent of the total variation was explained by the factors.

The loadings making up the 33 extracted factors were used to compute 33 scores for each subject. These scores were used as new variables, correlations were computed, and a second factor extraction was performed. Seven factors accounted for almost all variations noted. These seven factors were rotated and then since they were in terms of the 33 first-order factors, several matrix multiplications converted back to the original 164 variables, i.e., the correlations between the seven new factors and the original 164 variables were computed. Finally the seven factors of 164 variables each were rotated by the quartimax procedure (55). Unfortunately, the quartimax program would not handle all seven factors at once, and this final rotation was done using the first five factors followed by the last two. However, since this last rotation did not change the factors appreciably, the procedure seemed acceptable.

RESULTS

Phase I - The Area Studies

The raw data for the 362 variables, their correlations, and the factors underlying these correlations are presented in Appendices A through F in terms of the categories indicated in pages 15 through 18. Special forms utilized in the collection of the data are given in the appropriate appendix. In addition, writeups are included for the area studies in which the factors were interpreted and labeled with the assistance of experts in these fields.

Data in the appendices are presented in sufficient detail to permit specialists in the respective areas to compare scores on various tests with those of other service or civilian populations, to explore intercorrelations of particular interest to them, or to work further with the data if they so desire. For the readers interested in following certain individual subjects, Appendix G indicates the particular men whose records were incomplete for specific tests.

Phase II - Inter-Area Relationships

Matrix A

This matrix was composed of 48 variables representing 28 physiological measures which included response ratios for leucocyte, lymphocyte, and 17-ketosteroid output as well as creatinine output measures and 20 psychological variables representing the MMPI, the Navy Basic Battery, the Navy Enlisted Personal Inventory, the two-hand coordination test and the tank performance grade. These variables are summarized in Table 1 along with their means and standard deviations. The correlation coefficients for these 48 variables are presented in Table 2. A correlation coefficient must exceed ±0.205 to be significantly different from zero (0.05 level). The nine factors extracted from this matrix are presented in Table 3.

Lymphocyte Factors. Factor 1 had highly significant positive loadings on variables 01, 02, and 03 and on variables 07, 08, and 09, representing the total leucocyte and total lymphocyte ratios, respectively, obtained for the psychological stress situation. The basal creatinine sample obtained for the tank stress situation (variable 23) had a slightly significant loading of 0.275 on this factor, but no physiological significance is attached to this finding. Since the lymphocytes represent between 30 and 40 per cent of the total leucocyte counts, the high loadings on the latter result from their high correlation with the lymphocytes. Accordingly, the designation assigned to factor 1 is the change in lymphocyte ratios resulting from the psychological stress situation.

Factor 4 had significant loadings on variables 04, 05, and 06 as well as 10, 11, and 12, representing the leucocyte and lymphocyte ratios obtained from the tank stress situation. A positive loading of slight significance was found for the creatinine sample obtained after the psychological stress (variable 22) and a negative loading of equally slight significance for the GCT score (variable 40). No biological significance is attached to this finding. This factor is termed the change in lymphocyte ratios resulting from the tank stress situation.

Table 1

Summary of Variables for Matrix A With Their Means and Standard Deviations
Population = 88

Variable No.		Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01		Total Leucocyte Count Ratio - Pre Stress/Basal	P*	Percent of Basal Value	86.967	± 19.8833
02		Total Leucocyte Count Ratio - Stress/Basal	P	Percent of Basal Value	100.659	± 24.2828
03		Total Leucocyte Count Ratio - Post Stress/Basal	P	Percent of Basal Value	98.919	± 21.6793
04		Total Leucocyte Count Ratio - Pre Stress/Basal	T**	Percent of Basal Value	89.455	± 22.2401
05		Total Leucocyte Count Ratio - Stress/Basal	T	Percent of Basal Value	111.478	± 28.8671
06		Total Leucocyte Count Ratio - Post Stress/Basal	T	Percent of Basal Value	119.842	± 31.6363
07		Total Lymphocyte Count Ratio - Pre Stress/Basal	P	Percent of Basal Value	78.432	± 18.3870
08		Total Lymphocyte Count Ratio - Stress/Basal	P	Percent of Basal Value	91.916	± 27.2370
09		Total Lymphocyte Count Ratio - Post Stress/Basal	P	Percent of Basal Value	87.103	± 21.9164
10		Total Lymphocyte Count Ratio - Pre Stress/Basal	T	Percent of Basal Value	81.557	± 43.9133
11		Total Lymphocyte Count Ratio - Stress/Basal	T	Percent of Basal Value	77.598	± 20.8659
12		Total Lymphocyte Count Ratio - Post Stress/Basal	T	Percent of Basal Value	83.914	± 23.1397
13		17-Ketosteroid Output Ratio - Pre Stress/Basal	P	Percent of Basal Value	186.597	±121.8891
14		17-Ketosteroid Output Ratio - Stress/Basal	P	Percent of Basal Value	164.234	±114.4386
15		17-Ketosteroid Output Ratio - Post Stress/Basal	P	Percent of Basal Value	165.939	±126.0235
16		17-Ketosteroid Output Ratio - Pre Stress/Basal	T	Percent of Basal Value	246.507	±279.0721
17		17-Ketosteroid Output Ratio - Stress/Basal	T	Percent of Basal Value	199.923	±236.2695
18		17-Ketosteroid Output Ratio - Post Stress/Basal	T	Percent of Basal Value	200.920	±285.9366
19		Creatinine Sample - Basal	P	Grams per 24 Hours	1.742	± 0.6503
20		Creatinine Sample - Pre Stress	P	Grams per 24 Hours	1.830	± 0.4624
21		Creatinine Sample - Stress	P	Grams per 24 Hours	2.013	± 0.5355
22		Creatinine Sample - Post Stress	P	Grams per 24 Hours	2.010	± 0.5113
23		Creatinine Sample - Basal	T	Grams per 24 Hours	1.457	± 0.3374
24		Creatinine Sample - PreStress	T	Grams per 24 Hours	1.763	± 0.5364
25		Creatinine Sample - Stress	T	Grams per 24 Hours	2.029	± 0.5796
26		Creatinine Sample - Post Stress	T	Grams per 24 Hours	2.023	± 0.5832
27		17-Ketosteroid Output	-	Milligrams per Hour	0.240	± 0.0937
28		Androgen Output	-	Milligrams per Hour	0.128	± 0.0743
29	Minnesota Multiphasic Personality Inventory	Lie Value	P	Standard T Score	54.307	± 6.3125
30		F (Validity) Value	P	Standard T Score	52.341	± 3.4836
31		Hs (Hypochondriasis) Value	P	Standard T Score	45.784	± 5.4297
32		D (Depression) Value	P	Standard T Score	47.705	± 7.5797
33		Hy (Hysteria) Value	P	Standard T Score	52.295	± 5.7218
34		Pd (Psychopathic Deviate) Value	P	Standard T Score	51.648	± 8.0587
35		Mf (Interest) Value	P	Standard T Score	50.614	± 8.8401
36		Pa (Paranoia) Value	P	Standard T Score	48.045	± 7.2269
37		Pt (Psychasthenia) Value	P	Standard T Score	44.386	± 6.3904
38		Sc (Schizophrenia) Value	P	Standard T Score	46.205	± 5.4586
39		Ma (Hypomania) Value	P	Standard T Score	58.148	± 8.7540
40	Navy Basic Battery	General Classification Test Value	-	Test Score	58.886	± 6.4370
41		Arithmetic Reasoning Value	-	Test Score	57.420	± 9.1372
42		Mechanical Aptitude Value	-	Test Score	57.568	± 6.3278
43		Mechanical Knowledge Value	-	Test Score	54.364	± 8.2812
44		Electrical Knowledge Value	-	Test Score	54.670	± 8.3525
45	Navy Enlisted Personal Inventory	Personal History	P	Test Score	1.182	± 1.4267
46		Medical History	P	Test Score	0.068	± 0.2954
47		Two Hand Coordination Test	P	C Score	11.795	± 1.9188
48		Tank Grade	T	Performance Grade	2.875	± 0.4501

* P = Psychological Stress.

** T = Tank Stress.

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
01	01																			
02	.533	02																		
03	.495	.559	03																	
04	.254	.174	.137	04																
05	.151	.015	.112	.583	05															
06	-.012	.013	-.139	.536	.672	06														
07	.710	.366	.284	.176	-.012	.033	07													
08	.235	.611	.142	.081	-.079	.120	.535	08												
09	.224	.299	.469	.110	-.023	.046	.496	.618	09											
10	.176	.135	.149	.475	.163	.235	.104	.007	.065	10										
11	.217	.098	.205	.313	.515	.217	.169	009	.003	.217	11									
12	.038	.113	-.115	.351	.295	.581	.125	.242	.059	.334	.555	12								
13	.065	.051	.223	-.179	.005	-.052	-.027	.026	.022	-.144	.175	.042	13							
14	-.003	.088	.202	-.023	-.102	-.107	-.036	.022	.236	-.063	.082	.025	.261	14						
15	.080	.053	.194	-.289	-.103	-.090	.029	.033	.012	-.125	.130	.020	.647	.413	15					
16	.006	-.076	-.085	.038	-.054	.013	.062	.072	.132	.016	-.064	-.038	-.010	.094	-.014	16				
17	.012	-.022	.049	.020	-.146	-.075	.005	.076	.296	.001	-.039	-.002	.023	.523	.202	.680	17			
18	.180	.014	.056	.113	.088	.067	.167	.049	.176	.008	.060	-.028	-.022	.013	-.045	.665	.553	18		
19	.048	.024	.132	.129	-.072	.025	-.002	.064	.148	.090	-.053	.184	.052	.110	.134	.048	.146	-.087	19	
20	.038	.137	-.062	.129	.042	-.054	-.011	.038	-.092	.161	.161	.065	-.256	-.181	-.288	.083	-.013	.058	-.200	20
21	.183	.067	.030	.321	.121	.055	.031	-.027	-.126	.130	.134	.156	-.083	-.177	-.115	.002	-.015	-.087	.398	.257
22	.121	.158	.006	.305	.234	.172	.073	.099	.022	.186	.301	.292	-.307	-.023	-.228	-.067	-.041	-.061	.198	.512
23	.277	.213	.040	.417	.218	.092	.218	.222	.199	.026	.101	-.017	-.104	-.102	-.274	.230	.101	.213	.267	.194
24	.136	.100	-.031	.039	.014	.052	.081	.172	.036	.096	.070	.093	-.069	-.149	-.114	.217	.040	.039	.068	.240
25	.290	.161	.060	.048	-.063	-.192	.180	.045	.022	.003	-.032	-.085	-.096	.052	-.125	-.004	.020	.071	.173	.175
26	.036	.003	-.044	.124	.144	.102	-.019	.006	.090	.014	.151	.186	-.077	-.044	-.219	.124	.082	.209	.177	.289
27	.073	-.042	-.010	.118	.159	.027	-.028	-.152	-.122	.191	.093	-.094	-.311	-.389	-.314	-.164	-.279	.004	-.182	.303
28	-.137	-.079	-.069	-.106	.122	.015	-.169	-.087	-.024	.045	.006	-.147	-.156	-.245	-.184	-.188	-.256	-.056	-.170	.077
29	-.140	-.057	-.093	-.013	.120	.209	-.103	-.004	-.065	-.049	.065	.179	-.103	-.065	-.063	-.101	-.146	-.057	.117	-.069
30	.106	.125	.038	-.147	-.176	-.087	.110	.145	.179	-.052	-.028	.073	.023	.010	.013	-.029	.040	.013	-.205	-.077
31	-.006	-.004	.006	-.033	-.117	.021	.065	.087	.081	-.059	-.004	.064	.054	.014	.072	.048	.100	.112	-.143	-.095
32	-.015	.086	.009	.127	.005	.166	.074	.087	.012	.005	-.096	.086	-.030	.019	.040	-.049	-.082	-.076	.042	-.096
33	.001	.031	.121	.067	.098	.126	-.022	-.041	.011	-.072	.180	.098	-.026	.164	.130	-.113	.008	.018	-.024	.073
34	.098	.012	-.011	-.141	-.107	-.106	.048	.078	.116	-.222	-.045	-.039	.338	.216	.287	-.142	.100	-.082	.011	-.120
35	-.087	-.154	.027	-.141	-.190	-.019	-.016	-.195	-.035	-.070	-.075	-.073	-.066	.014	-.004	.204	.118	.125	-.140	-.014
36	-.078	-.079	-.015	-.137	.058	.204	-.105	-.069	-.025	-.167	-.068	.098	.106	.015	.033	-.137	-.195	-.128	.086	-.141
37	-.029	-.078	-.004	-.141	-.232	-.073	.054	.072	.167	-.042	-.160	-.019	.085	.036	-.024	.120	.156	.083	-.170	-.181
38	.060	-.002	-.001	-.152	-.199	-.081	.119	.118	.132	-.089	-.038	-.004	.175	.019	.066	.332	.254	.281	-.238	-.082
39	-.058	-.036	-.046	.013	-.182	-.093	.080	.089	.132	.053	.071	.166	-.023	.052	-.006	.293	.229	.096	-.111	.113
40	-.062	.002	.002	-.160	-.137	-.201	-.067	-.056	-.061	-.171	-.009	-.122	-.034	.104	.056	.179	.212	.189	-.224	.152
41	.017	-.067	.042	-.081	-.147	-.170	-.058	-.099	-.063	-.175	.010	-.136	.160	.028	.090	.259	.181	.231	-.035	.012
42	-.061	.026	.070	.136	-.162	.049	-.052	-.010	-.004	.034	.299	.187	.012	-.050	-.086	-.005	.025	.062	-.029	.217
43	.034	.078	-.018	.015	.038	.080	.062	.073	.075	.043	.128	.166	-.126	-.109	-.133	.134	.080	.140	-.045	.108
44	-.202	.131	-.100	.023	.049	.118	-.118	.219	.085	-.039	.132	.216	-.117	.083	-.100	.104	.087	.116	-.002	.035
45	-.060	-.025	-.058	.011	-.051	.072	-.065	-.020	-.041	.023	.009	.104	-.013	.016	.025	.358	.328	.366	-.054	-.132
46	-.080	-.097	-.110	.023	-.062	.010	-.163	-.101	-.053	.042	.075	.087	-.120	-.127	-.120	.091	.133	.257	-.088	-.002
47	.074	.083	.138	.177	.097	-.009	-.073	.010	.073	.187	.074	-.004	.045	.052	.069	.125	.085	.065	.076	.222
48	.087	.068	.091	.030	-.135	-.240	.109	-.006	.010	.158	.070	-.021	.040	.090	.106	-.056	.028	.042	-.007	-.012

Table 2

Intercorrelations for Matrix A
Population = 88

20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
20																					
.257	21																				
.512	.360	22																			
.194	.304	.219	23																		
.240	.163	.195	.199	24																	
.175	.249	.241	.204	.309	25																
.289	.218	.412	.362	.269	.372	26															
.303	.146	.196	.102	.005	-.038	.238	27														
.077	.017	-.042	.034	.007	.036	.078	.618	28													
-.069	.024	-.002	-.064	-.225	-.048	.115	.003	.002	29												
-.077	-.152	-.283	-.117	-.041	-.226	-.017	-.048	-.058	-.006	30											
-.095	-.012	-.170	-.245	-.070	-.171	.079	.018	-.223	.138	.303	31										
-.096	-.008	-.027	-.049	.111	-.075	-.026	-.057	-.089	.358	.007	.200	32									
.073	.042	.127	-.077	-.048	.007	.058	-.044	-.074	.484	.046	.219	.268	33								
-.120	-.023	-.091	-.052	.032	-.012	.024	-.061	-.001	-.010	.193	.269	.179	.104	34							
-.014	-.082	-.103	-.121	-.102	-.175	-.168	.028	-.030	.121	.101	.218	.144	.147	-.017	35						
-.141	-.037	-.111	-.236	-.158	-.143	-.125	-.044	.031	.348	-.034	.129	.209	.394	.046	.318	36					
-.181	-.147	-.288	-.228	.032	-.218	-.074	-.130	-.186	-.208	.442	.616	.013	-.224	.143	.377	-.008	37				
-.082	-.113	-.262	-.129	.081	-.103	.009	-.098	-.159	-.210	.461	.607	-.067	-.114	.223	.389	.025	.735	38			
.113	-.135	.048	-.039	.105	.015	.004	-.037	-.111	-.216	.264	.021	-.280	-.116	.041	.124	-.203	.198	.394	39		
.152	.009	-.141	-.088	-.001	.021	.005	.115	.263	-.244	.052	-.126	-.082	-.034	.038	-.040	-.257	-.014	.124	.109	40	
.012	-.007	-.066	.070	-.046	-.078	.081	.029	.058	-.131	.035	-.082	-.023	.012	-.052	.067	-.074	.079	.201	.083	.504	41
.217	.136	.079	.017	-.025	.035	-.043	.145	.149	-.008	.141	-.147	-.175	.071	-.150	-.024	-.057	-.074	.079	.309	.243	.226
.108	.250	.028	.083	.101	.075	.156	.121	.154	-.082	.287	-.100	-.184	-.239	-.052	-.005	-.196	.024	.201	.257	.113	.007
.035	.088	.113	.029	-.017	-.001	.097	.014	.166	.173	.152	-.036	.036	-.016	-.153	-.096	-.177	-.066	.066	.098	.245	.114
-.132	-.207	-.161	-.132	-.045	-.266	-.043	-.127	-.300	.022	.159	.419	.062	.043	.128	.377	.169	.350	.515	.164	-.054	078
-.002	-.024	-.083	-.026	-.104	-.137	.006	.097	-.036	.217	.156	.475	-.078	.185	-.033	.213	.079	.248	.326	.241	-.177	-.083
.222	.264	.173	.118	.124	.093	.047	.002	.070	-.108	.045	-.103	.043	-.008	-.148	-.044	-.090	-.048	-.004	-.003	.121	.051
-.012	-.036	-.081	-.101	-.112	-.040	-.086	.091	.016	.062	.145	.092	.006	.144	.178	-.047	-.147	-.007	-.064	-.068	.035	-.132

	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
29	.002																				
30	-.058	-.006																			
31	-.223	.158	.303																		
32	-.089	.358	.007	.200																	
33	-.074	.484	.046	.219	.268																
34	-.001	-.010	.193	.269	.179	.104															
35	-.030	.121	.101	.218	.144	.147	-.017														
36	.031	.348	-.034	.129	.209	.394	.046	.318													
37	-.186	-.208	.442	.616	.013	-.224	.143	.377	-.008												
38	-.159	-.210	.461	.607	-.067	-.114	.223	.389	.025	.735											
39	-.111	-.216	.264	.021	-.280	-.116	.041	.124	-.203	.198	.394										
40	.263	-.244	.052	-.176	-.082	-.034	.038	-.040	-.257	-.014	.124	.109									
41	.058	-.131	.035	-.082	-.023	.012	-.052	.067	-.074	.079	.201	.083	.504								
42	.149	-.008	.141	-.147	-.175	.071	-.150	-.024	-.057	-.074	.079	.309	.243	.226							
43	.154	-.082	.287	-.100	-.184	-.239	-.052	-.005	.196	.024	.201	.257	.113	.007	.396						
44	.166	.173	.152	-.036	.036	-.016	-.153	-.096	-.177	-.066	.066	.098	.245	.114	.383	.449					
45	-.300	.022	.159	.419	.062	.043	.128	.377	.169	.350	.515	.164	-.054	.078	-.029	.129	.056				
46	-.036	.217	.156	.475	-.078	.185	-.033	.213	.079	.248	.326	.241	-.177	-.083	.090	.107	.070	.352			
47	.070	-.108	.045	-.103	.043	-.008	-.148	-.044	-.090	-.048	-.004	-.003	.121	.051	.342	.387	.178	-.083	.025		
48	.016	.062	.145	.092	.006	.144	.178	-.047	-.147	-.007	-.064	-.068	.035	-.132	-.015	.019	-.109	.000	.065	.223	

Table 3

Rotated Factor Loadings of Matrix A

Variable No.		Description of Variable	1	2	3	4	5	6	7	8	9
01		Total Leucocyte Count Ratio - Pre Stress/Basal (P)*	719	-034	-080	095	016	-018	043	243	047
02		Total Leucocyte Count Ratio - Stress/Basal (P)	722	-058	019	065	036	136	-016	038	-021
03		Total Leucocyte Count Ratio - Post Stress/Basal (P)	566	-080	001	032	170	085	138	270	-044
04		Total Leucocyte Count Ratio - Pre Stress/Basal (T)**	206	-178	-206	686	-150	-083	-080	244	010
05		Total Leucocyte Count Ratio - Stress/Basal (T)	-012	-277	-024	698	-094	009	068	150	-050
06		Total Leucocyte Count Ratio - Post Stress/Basal (T)	-046	-078	-048	772	-063	-036	138	-228	-175
07		Total Lymphocyte Count Ratio - Pre Stress/Basal (P)	732	062	-087	066	-012	-054	030	-040	014
08		Total Lymphocyte Count Ratio - Stress/Basal (P)	650	070	-056	064	089	098	-064	-428	-019
09		Total Lymphocyte Count Ratio - Post Stress/Basal (P)	630	102	-192	012	104	010	-022	-165	-053
10		Total Lymphocyte Count Ratio - Pre Stress/Basal (T)	165	-048	022	403	-135	-006	-038	226	105
11		Total Lymphocyte Count Ratio - Stress/Basal (T)	084	-053	083	534	139	287	-106	285	038
12		Total Lymphocyte Count Ratio - Post Stress/Basal (T)	020	095	120	715	186	190	-176	-182	-062
13		17-Ketosteroid Output Ratio - Pre Stress/Basal (P)	048	058	110	-020	646	082	120	031	110
14		17-Ketosteroid Output Ratio - Stress/Basal (P)	062	-048	-192	-112	575	024	-028	118	-082
15		17-Ketosteroid Output Ratio - Post Stress/Basal (P)	042	-004	070	-128	730	100	166	091	-020
16		17-Ketosteroid Output Ratio - Pre Stress/Basal (T)	-050	162	-788	000	026	052	-038	-120	104
17		17-Ketosteroid Output Ratio - Stress/Basal (T)	030	162	-764	-116	334	056	-118	090	-014
18		17-Ketosteroid Output Ratio - Post Stress/Basal (T)	096	178	-701	036	-069	104	042	140	-004
19		Creatinine Sample - Basal (P)	079	-270	-069	085	252	-114	-328	-182	-066
20		Creatinine Sample - Pre Stress (P)	-014	-106	-104	044	-384	210	-379	168	035
21		Creatinine Sample - Stress (P)	052	-221	-027	181	-083	164	-465	024	-076
22		Creatinine Sample - Post Stress (P)	066	-278	-028	298	-206	028	-542	068	-039
23		Creatinine Sample - Basal (T)	275	-252	-330	167	-196	-064	-261	-068	096
24		Creatinine Sample - Pre Stress (T)	138	-004	-105	081	-140	004	-335	-190	178
25		Creatinine Sample - Stress (T)	193	-250	-052	-166	-078	-014	-504	-012	070
26		Creatinine Sample - Post Stress (T)	025	-044	-176	143	-170	051	-532	-028	010
27		17-Ketosteroid Output	028	-030	115	030	-670	197	050	264	-004
28		Androgen Output	-034	-200	170	-139	-481	322	166	010	002
29	Minnesota Multiphasic Personality Inventory	Lie Value (P)	-109	-050	147	119	-026	011	-023	-053	-685
30		F (Validity) Value (P)	169	522	145	-074	037	275	060	-033	025
31		Hs (Hypochondriasis) Value (P)	036	712	-022	044	066	-128	-106	153	-340
32		D (Depression) Value (P)	090	006	011	070	046	-103	062	-181	-458
33		Hy (Hysteria) Value (P)	-007	-014	008	048	128	068	-088	170	-657
34		Pd (Psychopathic Deviate) Value (P)	126	240	092	-157	289	-060	-071	-020	-066
35		Mf (Interest) Value (P)	-144	394	-140	-051	-100	-034	141	-050	-290
36		Pa (Paranoia) Value (P)	-116	076	181	076	050	-136	155	-192	-560
37		Pt (Psychasthenia) Value (P)	032	786	-064	-026	052	-092	078	-058	118
38		Sc (Schizophrenia) Value (P)	053	871	-216	-022	057	148	-000	-096	116
39		Ma (Hypomania) Value (P)	-006	369	-122	012	028	232	-134	-083	290
40	Navy Basic Battery	General Classification Test Value	-091	-078	-300	-284	-042	499	186	044	136
41		Arithmetic Reasoning Value	-158	-016	-361	-108	048	316	183	-056	096
42		Mechanical Aptitude Value	-080	-020	014	160	-037	649	-055	054	046
43		Mechanical Knowledge Value	070	142	-032	076	-148	580	-180	-098	182
44		Electrical Knowledge Value	-048	-014	-114	110	-044	541	-051	-229	-070
45	Navy Enlisted Personal Inventory	Personal History (P)	-111	554	-298	143	076	-044	122	-001	-119
46		Medical History (P)	-165	459	-046	084	-132	032	-115	227	-182
47		Two Hand Coordination Test (P)	083	-095	-092	060	027	422	-204	159	000
48		Tank Grade (T)	138	054	096	-138	079	082	004	368	-102

* P = Psychological Stress.

** T = Tank Stress.

Table 3

Rotated Factor Loadings of Matrix A

Variable No.		Description of Variable	1	2	3	4	5	6	7	8	9
01		Total Leucocyte Count Ratio - Pre Stress/Basal (P)*	719	-034	-080	095	016	-018	043	243	047
02		Total Leucocyte Count Ratio - Stress/Basal (P)	722	-058	-019	065	036	136	-016	038	-021
03		Total Leucocyte Count Ratio - Post Stress/Basal (P)	566	-080	001	032	170	085	138	270	-044
04		Total Leucocyte Count Ratio - Pre Stress/Basal (T)**	206	-178	-206	686	-150	-083	-080	244	010
05		Total Leucocyte Count Ratio - Stress/Basal (T)	-012	-277	-024	698	-094	009	068	150	-050
06		Total Leucocyte Count Ratio - Post Stress/Basal (T)	-046	-078	-048	772	-063	-036	138	-228	-175
07		Total Lymphocyte Count Ratio - Pre Stress/Basal (P)	732	062	-087	066	-012	-054	030	-040	014
08		Total Lymphocyte Count Ratio - Stress/Basal (P)	650	070	-056	064	089	098	-064	-428	-019
09		Total Lymphocyte Count Ratio - Post Stress/Basal (P)	630	102	-192	012	104	010	-022	-165	-053
10		Total Lymphocyte Count Ratio - Pre Stress/Basal (T)	165	-048	022	403	-135	-006	-038	226	105
11		Total Lymphocyte Count Ratio - Stress/Basal (T)	084	-053	083	534	139	287	-106	285	038
12		Total Lymphocyte Count Ratio - Post Stress/Basal (T)	020	095	120	715	186	190	-176	-182	-062
13		17-Ketosteroid Output Ratio - Pre Stress/Basal (P)	048	058	110	-020	646	082	120	031	110
14		17-Ketosteroid Output Ratio - Stress/Basal (P)	062	-048	-192	-112	575	024	-028	118	-082
15		17-Ketosteroid Output Ratio - Post Stress/Basal (P)	042	-004	070	-128	730	100	166	091	-020
16		17-Ketosteroid Output Ratio - Pre Stress/Basal (T)	-050	162	-788	000	026	052	-038	-120	104
17		17-Ketosteroid Output Ratio - Stress/Basal (T)	030	162	-764	-116	334	056	-118	090	-014
18		17-Ketosteroid Output Ratio - Post Stress/Basal (T)	096	178	-701	036	-069	104	042	140	-004
19		Creatinine Sample - Basal (P)	079	-270	-069	085	252	-114	-328	-182	-066
20		Creatinine Sample - Pre Stress (P)	-014	-106	-104	044	-384	210	-379	168	035
21		Creatinine Sample - Stress (P)	052	-221	-027	181	-083	164	-465	024	-076
22		Creatinine Sample - Post Stress (P)	066	-278	-028	298	-206	028	-542	068	-039
23		Creatinine Sample - Basal (T)	275	-252	-330	167	-196	-064	-261	-068	096
24		Creatinine Sample - Pre Stress (T)	138	-004	-105	081	-140	004	-335	-190	178
25		Creatinine Sample - Stress (T)	193	-250	-052	-166	-078	-014	-504	-012	070
26		Creatinine Sample - Post Stress (T)	025	-044	-176	143	-170	051	-532	-028	010
27		17-Ketosteroid Output	028	-030	115	030	-670	197	050	264	-004
28		Androgen Output	-034	-200	170	-139	-481	322	166	010	002
29	Minnesota Multiphasic Personality Inventory	Lie Value (P)	-109	-050	147	119	-026	011	-023	-053	-685
30		F (Validity) Value (P)	169	522	145	-074	037	275	060	-033	025
31		Hs (Hypochondriasis) Value (P)	036	712	-022	044	066	-128	-106	153	-340
32		D (Depression) Value (P)	090	006	011	070	046	-103	062	-181	-458
33		Hy (Hysteria) Value (P)	-007	-014	008	048	128	068	-088	170	-657
34		Pd (Psychopathic Deviate) Value (P)	126	240	092	-157	289	-060	-071	-020	-066
35		Mf (Interest) Value (P)	-144	394	-140	-051	-100	-034	141	-050	-290
36		Pa (Paranoia) Value (P)	-116	076	181	076	050	-136	155	-192	-560
37		Pt (Psychasthenia) Value (P)	032	786	-064	-026	052	-092	078	-058	118
38		Sc (Schizophrenia) Value (P)	053	871	-216	-022	057	148	-000	-096	116
39		Ma (Hypomania) Value (P)	-006	369	-122	012	028	232	-134	-083	290
40	Navy Basic Battery	General Classification Test Value	-091	-078	-300	-284	-042	499	186	044	136
41		Arithmetic Reasoning Value	-158	-016	-361	-108	048	316	183	-056	096
42		Mechanical Aptitude Value	-080	-020	014	160	-037	649	-055	054	046
43		Mechanical Knowledge Value	070	142	-032	076	-148	580	-180	-098	182
44		Electrical Knowledge Value	-048	-014	-114	110	-044	541	-051	-229	-070
45	Navy Enlisted Personal Inventory	Personal History (P)	-111	554	-298	143	076	-044	122	-001	-119
46		Medical History (P)	-165	459	-046	084	-132	032	-115	227	-182
47		Two Hand Coordination Test (P)	083	-095	-092	060	027	422	-204	159	000
48		Tank Grade (T)	138	054	096	-138	079	082	004	368	-102

* P = Psychological Stress.

** T = Tank Stress.

Reference to the column of means in Table 1 indicates that the lymphocyte counts tended to decrease in the pre-stress, stress, and post-stress samples when compared to the basal values. This was true for both the psychological and tank stress situations. The means revealed no consistent trend for the leucocyte ratios; both increases and decreases occurred in the pre-stress, stress, and post-stress samples as compared to the basal values.* Averaging the three means for variables 01, 02, and 03 yields a value of 95.51 per cent, indicating that the stress counts (pre-stress, stress, and post-stress) were approximately 4.5 per cent lower than the basal value. In contrast, the same computation for the tank stress values revealed an average increase in the stress counts of approximately 7.3 per cent over the basal value. The same comparison for the lymphocyte ratios showed that decreases of approximately 14.2 per cent and 22.0 per cent occurred for the psychological and tank stresses, respectively. Compensating changes in certain other types of white cells tended to maintain the leucocyte count at a fairly stable level.

17-Ketosteroid Factors. Factor 3 had highly significant loadings on variables 16, 17, and 18, representing the three ketosteroid output ratios resulting from the tank stress experience. Less significant loadings were found for variables 41, 23, 40, 45, 38, and 04, listed in descending order of magnitude. Since these six variables had loadings of approximately one-quarter to one-half those found for the ketosteroid output measures, no particular biological importance is attached to them. The factor is designated as the change in 17-ketosteroid output resulting from the tank stress situation.

Factor 5 had significantly positive loadings on variables 13, 14, and 15, representing the 17-ketosteroid output resulting from the psychological stress. The significant loading on variable 27 represents the average ketosteroid output for the two basal periods. The fact that the sign of the loading is opposite to those for variables 13, 14, and 15 is simply an arithmetic artifact arising from the use of ratios in one case and absolute values in the other. When the basal sample increases relative to the stress measures, the ratio is decreased and vice versa. The same reason accounts for the negative loading on variable 28, androgen output, these determinations being made from the basal urine

*A mean of 100 represents no change between the basal value and the sample to which it is compared, with values less than 100 indicating decreases in the count and values in excess of 100 representing increases.

samples. Additional positive loadings of lesser significance were found for variables 17, 34, and 19, listed in decreasing order of magnitude. Negative loadings of -0.384 and -0.206 were found for variables 20 and 22, respectively. Since the most significant loadings were on variables 13, 14, 15, and 27, the factor is designated as the change in 17-ketosteroid output resulting from the psychological stress situation.

Table 1 indicates that the mean increase in ketosteroid output for the stress measures as compared to the basal value was approximately 72.6 per cent for the psychological stress and 115.8 per cent for the tank stress situation. It should be noted that the large standard deviations found for variables 13-18 reflect the great variability in 17-ketosteroid response among subjects.

Creatinine Factor. Factor 7 had significant loadings on variables 19-26, representing all of the creatinine measures and is consequently termed a general creatinine output factor. It will be noted that the magnitude of the factor loadings for these variables roughly paralleled the mean values reported for them in Table 1. The two basal values had the smallest means and also possessed the smallest loadings. The stress and post-stress had the largest means and the highest loadings, with the pre-stress values in an intermediate position for both the factor loadings and for size of means.

Psychological Factors. Factor 6 had its highest significant loadings on variables 42, 43, 44, 40, and 47, listed in decreasing order of magnitude. Since these variables represented, respectively, mechanical aptitude, mechanical knowledge, electrical knowledge, GCT, and two-hand coordination test, the factor is designated as mechanical coordination. The factor had a significant positive loading also on the validity scale of the MMPI (variable 30) indicating that persons high in mechanical coordination were meticulous in answering the questions of the personality test. A barely significant loading on variable 39, the MMPI hypomania scale, represents a logical pattern in that overactive individuals often find outlet in mechanical pursuits. Similarly, the significant loading on androgen output (variable 28) suggests that such individuals possess a slightly higher degree of masculinity and in general that the more masculine person has greater interest in mechanical tasks. The significant loading on arithmetic reasoning (variable 41) is not illogical for this factor since mechanical ability does require certain numerical proficiencies. No biological significance is attached to the slightly significant loadings found for variables 11 and 20.

Factor 2 had high positive loadings on the validity (0.522), hypochondriasis (0.712), psychasthenia (0.786), and schizophrenia

(0.871) scales of the MMPI, and lower but still significant loadings on psychopathic deviate (0.240), masculinity-femininity interest (0.394), and hypomania (0.369) scales of the MMPI. In addition, significant loadings on the personal history (0.554) and medical history (0.459) sections of the Navy Enlisted Personal Inventory were found. In general, then, the factor had significant projections on most items which measured neurotic tendencies and accordingly it is labeled tendency to personality maladjustment. The word "tendency" is employed to emphasize that the group was a normal one. Factor 2 appears comparable to the general factor "maladjusted tendencies" isolated by Cottle in his study of the MMPI and the Bell Adjustment Inventory (57). No biological significance is attached by the author to the slightly significant negative loadings found for variables 22, 05, 19, 23, 25, 21, and 28.

Factor 9 is labeled stability of personality. It had highly significant negative loadings on the lie index (-0.685), hysteria (-0.657), paranoia (-0.560), and depression (-0.458) scales of the MMPI. The high loading on the lie index of the MMPI is logical in that individuals tending toward paranoia approach personality tests suspiciously, and are prepared to admit nothing which might show them in an unfavorable light. The loading of -0.290 on the interest scale suggests that individuals high on this factor were the more masculine members of the group. The loading of -0.340 on the MMPI hypochondriasis scale also appears to be logical in terms of the stability of personality pattern evident in this factor. A positive loading of 0.290 on the MMPI hypomania scale is consistent with the pattern shown by this factor.

Residuals. Factor 8 is a poorly defined factor with slightly significant loadings on a variety of blood and ketosteroid variables, on tank grade, medical history, and electrical knowledge measures. There is weak evidence that it might represent some type of contrast between the psychological and tank stress situations as evidenced by the loadings on variables 11 and 08 and on variables 03 and 06. The factor probably does not warrant further study.

Matrix B

This matrix was composed of 47 variables (numbered from 49-95) representing physical examination, anthropometric, and physical fitness measures. These variables with their means and standard deviations are itemized in Table 4. The intercorrelation of these 47 variables are presented in Table 5, and the resultant eight factors derived from them are listed in Table 6.

Anthropometric Factors. Factor 1 had highly significant loadings on variables 75, 82, 72, 81, 73, 84, 95, and 69 with less significant loadings on variables 85, 71, 70, 83, and 50. All but two of these variables (95 and 50) represented measurements which are correlated with body size. Variable 95, which is the hand dynamometer score, reflects a measure of strength. Thus this factor is designated as size-strength. Although all of the size variables except No. 70 were confined to the upper torso, the fact that a significant loading for calf circumference (the only lower torso measurement taken) was obtained on this factor would suggest that probably no true demarcation exists between upper and lower torso.

Factor 3 had highly significant negative loadings on variables 74* and 78 with positive loadings on variables 69, 77, 83, 70, 81, 71, and 76. Positive loadings of lesser significance appeared on such measures as head circumference, hand breadth, general body hair distribution, hand dynamometer score, muscular tonus, and beard, with similarly less significant negative loadings on the prominence of the larynx, deep reflexes, and masculine component. It will be noted that the most significant loadings represented measures which reflect body-girth and accordingly, this label is given to the factor. As support for this concept, the ectomorphic component (variable 78) was inversely related to the mesomorphic (variable 77) and endomorphic (variable 76) components, the latter items representing much larger girth measures than would be expected from the ectomorph.

Factor 7 had its most significant loadings on variables 49, 56, and 57 which represent the total testicular volume and the dimensions of the penis, superior-inferior and lateral, respectively. Consequently this factor is labeled as genitalia size. A positive loading of slight significance was found for the endomorphic component (variable 76) which is opposite in sign to the loadings on the genital variables and lends support to the popular concept that the endomorphic individual possesses genital organs disproportionately small in comparison to his other bodily measurements. A barely significant negative loading on the masculine component (variable 80) probably reflects the fact that

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* The number of disproportions (variable 74) was obtained by computing a series of anthropometric indices (see Table F-5 of Appendix F) and then plotting them on a profile of body proportions form (see Figure F-4 of Appendix F). Any values located to the right of the vertical line indicate a disproportion for that particular index. The total number of such values represents the number of disproportions noted.

Table 4

Summary of Variables for Matrix B With Their Means and Standard Deviations
Population = 88

Variable No.	Description of Variable	Unit of Measurement	Mean	Standard Deviation
49	Total Testicular Volume	Cubic Centimeters	35.606	±11.7017
50	Muscular Tonus	5-Point Scale	3.114	± 0.5346
51	General Bodily Cleanliness	5-Point Scale	2.170	± 0.6647
52	Acne	5-Point Scale	1.864	± 0.7141
53	Perspiration - Hands	4-Point Scale	2.057	± 0.6841
54	Perspiration - Axillary	4-Point Scale	1.932	± 0.7994
55	Prominence of Larynx	5-Point Scale	2.932	± 0.7550
56	Penis (Superior-Inferior Dimension)	Millimeters	64.807	±12.0410
57	Penis (Lateral Dimension)	Millimeters	28.511	± 4.3891
58	Varicocele	4-Point Scale	1.261	± 0.5772
59	Cremasteric Reflex	5-Point Scale	2.989	± 0.7804
60	Rhomberg	5-Point Scale	2.875	± 0.8139
61	Deep Reflexes	5-Point Scale	3.205	± 0.8463
62	Tremors	5-Point Scale	3.034	± 0.8637
63	General Body Hair Distribution	5-Point Scale	2.125	± 1.0808
64	Pubic Hair Distribution	5-Point Scale	2.830	± 0.9496
65	Beard	5-Point Scale	2.659	± 0.7714
66	Cerumen	5-Point Scale	2.761	± 0.8164
67	Lymph Tissue Present	5-Point Scale	2.807	± 0.7249
68	Potential Lymph Tissue	5-Point Scale	3.318	± 0.7812
69	Chest Circumference	Centimeters	87.675	± 5.0169
70	Calf Circumference	Centimeters	35.497	± 2.0732
71	Face Breadth	Centimeters	13.698	± 4.6138
72	Hand Length	Centimeters	19.200	± 9.0083
73	Hand Breadth	Centimeters	8.647	± 4.3548
74	Disproportions	Number Present	3.239	± 2.3780
75	Hand Area	Square Centimeters	166.224	±14.0553
76	Somatotype A - Endomorphy	7-Point Scale } Sheldon Classification	2.443	± 0.6925
77	Somatotype B - Mesomorphy	7-Point Scale } Sheldon Classification	4.795	± 1.0189
78	Somatotype C - Ectomorphy	7-Point Scale } Sheldon Classification	3.318	± 1.1502
79	Dysplasia	Number Present	5.182	± 1.4427
80	Masculine Component	4-Point Scale	3.955	± 0.2998
81	Weight	Pounds	152.182	±17.9633
82	Stature	Centimeters	175.036	± 6.7089
83	Chest Depth	Centimeters	20.732	±12.7393
84	Bi-iliac	Centimeters	27.905	±15.1982
85	Head Circumference	Centimeters	56.077	±13.3638
86	Resting Pulse (Navy Step Test)	Beats Per Minute	82.636	±13.7684
87	Endurance Time (Harvard Step Test)	Seconds	294.693	±22.0868
88	Pulse Increase After Endurance Test (Harvard Step Test)	Beats Per Minute	106.966	±36.3228
89	Pulse for 3.0-3.5 Minute Interval (Harvard Step Test)	Beats Per 30 Seconds	58.943	± 5.3891
90	Standing Pulse Rate (Schneider Index)	Beats Per Minute	91.409	±13.9033
91	Standing Systolic Blood Pressure (Schneider Index)	Millimeters of Mercury	112.659	±10.2530
92	Reclining Systolic Blood Pressure (Schneider Index)	Millimeters of Mercury	115.409	± 9.0078
93	Reclining Diastolic Blood Pressure (Schneider Index)	Millimeters of Mercury	71.057	± 7.1331
94	Standing Pulse Pressure (Schneider Index)	Millimeters of Mercury	31.477	± 7.7400
95	Hand Dynamometer (Reading No. 1 - Right Hand)	Kilograms	46.705	± 6.4401

Variable No.	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
49	49																			
50	-.114	50																		
51	.057	.042	51																	
52	.125	.101	.243	52																
53	.158	-.018	-.047	-.243	53															
54	.016	.045	-.021	.064	.133	54														
55	.094	-.123	-.091	-.103	.097	-.046	55													
56	.108	.057	.026	.089	-.077	-.061	.265	56												
57	.412	-.069	.060	-.047	.025	-.069	.184	.310	57											
58	-.091	-.023	.062	-.219	.108	-.061	.121	.062	.024	58										
59	.037	-.162	-.041	-.127	.023	-.057	.116	-.041	.029	-.019	59									
60	.188	.033	.040	.109	-.070	-.049	-.014	.181	.115	-.052	-.147	60								
61	.011	-.128	-.124	-.201	.238	-.132	.130	-.078	-.022	.078	.125	-.280	61							
62	-.137	.066	.050	.082	.075	.270	-.014	-.096	-.250	.051	-.085	.039	-.041	62						
63	.016	.095	-.078	-.097	-.072	-.136	-.088	-.119	-.040	-.108	.193	-.204	.148	-.115	63					
64	.126	.061	-.081	.084	-.091	.030	-.113	.030	.126	-.128	-.080	.002	.087	-.007	.290	64				
65	.065	.095	-.244	-.106	.190	.036	-.040	-.122	-.033	-.004	.108	-.069	.073	.087	.520	.014	65			
66	.074	.089	-.072	.121	-.058	.257	-.045	-.117	.031	.012	-.022	.076	.121	.191	.060	.066	.234	66		
67	.136	-.032	-.074	.171	-.117	-.142	-.024	-.141	-.120	-.153	.118	.212	-.066	-.008	-.042	.119	-.119	.096	67	
68	.011	-.033	-.194	-.086	-.056	-.259	-.041	.026	-.011	-.008	.157	.226	.057	-.033	.075	.043	-.104	.012	.638	68
69	-.016	.288	.043	-.017	-.082	-.054	-.154	.008	.075	.006	-.164	.161	-.220	-.093	.210	-.140	.213	.131	-.130	-.12
70	-.062	.167	.013	-.040	-.006	-.029	-.193	-.007	.125	.064	-.034	.037	-.107	-.046	.071	-.130	.050	.215	.032	-.02
71	-.026	.243	-.062	-.130	.092	.152	-.113	-.194	.111	-.015	-.016	-.013	-.072	-.072	.063	-.103	.114	.102	-.015	-.03
72	.069	.165	.175	-.147	.099	.029	.101	.220	.170	.157	.033	.157	-.063	-.074	.054	-.091	.131	.009	-.118	-.16
73	.054	.293	-.060	.006	.037	.013	-.029	.058	.275	-.081	.025	.030	-.070	-.151	.105	.108	.140	.028	-.029	.00
74	-.050	-.275	-.055	-.103	.232	.166	.233	-.008	-.037	-.013	.088	-.139	.238	.125	-.258	.069	-.131	-.160	.034	.04
75	.071	.264	.054	-.084	.083	.026	.037	.152	.257	.036	.034	.101	-.070	-.131	.094	.008	.159	.024	-.089	-.09
76	-.126	-.169	.009	-.109	-.054	.035	-.205	-.239	-.098	-.006	.031	.181	-.098	-.064	.109	-.338	.179	.210	-.034	.07
77	.225	.254	-.169	-.007	.033	.039	-.168	-.056	.155	-.201	-.104	-.059	-.084	-.097	.232	.106	.159	.148	.055	-.10
78	-.157	-.190	.109	.081	-.082	-.001	.158	.209	-.162	.185	.043	-.068	.121	.174	-.273	-.013	-.187	-.200	-.022	-.02
79	.115	.033	.063	-.110	.234	-.049	.033	.083	-.066	-.072	.165	-.118	.242	-.088	.177	.132	.077	.086	.012	.08
80	.216	.176	-.076	.186	.013	-.013	.088	.316	.228	-.063	-.002	-.118	.128	.006	.089	.296	032	-.045	.065	-.03
81	-.055	.262	.015	-.088	.005	.081	-.104	-.058	.035	.073	-.014	.130	-.123	-.023	.146	-.148	.196	.201	-.071	-.09
82	-.071	.124	.059	-.138	.018	.181	.092	.132	.031	.149	.025	.126	.024	.017	-.036	-.022	.009	.063	-.068	-.13
83	-.081	.231	-.002	.005	-.068	-.006	-.092	-.031	.097	.036	-.101	.085	-.103	-.025	.229	-.017	.260	.140	-.118	-.05
84	-.058	.028	.003	-.185	.086	.018	-.066	.066	.177	.069	-.075	.115	-.044	.038	-.022	-.034	.035	.016	-.055	-.01
85	.184	.110	-.040	.159	-.082	.156	-.051	-.015	.149	-.031	-.171	.179	-.076	-.081	.059	.137	.153	.285	-.091	-.17
86	-.062	.159	.076	.042	.011	.115	.037	-.054	.010	.106	-.282	.175	.089	.166	-.148	.033	-.083	.100	.146	.05
87	.179	-.231	.070	.030	.083	.082	-.029	.059	.058	.029	.077	-.117	.134	-.179	-.073	.032	-.132	.097	-.027	-.04
88	-.075	-.083	-.074	-.084	.068	.039	.129	-.253	-.164	.102	.032	-.174	.089	.112	.120	.090	.109	.027	-.046	-.08
89	-.022	-.062	-.045	-.148	-.012	-.020	-.041	-.426	-.023	-.077	.153	-.091	.252	.208	.262	.142	.120	.143	.050	.13
90	.015	-.016	-.019	-.068	.062	-.053	.128	.059	.123	-.204	.177	.046	.249	.036	.020	.118	-.040	-.033	.153	.20
91	-.084	-.056	.009	-.185	.026	.128	-.031	-.282	.043	.175	-.078	.049	.084	.016	.044	-.119	.136	.059	.024	.05
92	-.232	-.019	.077	-.132	-.032	.101	-.156	-.455	-.149	.052	.123	-.017	.027	.062	.074	-.083	.095	.115	.114	.04
93	-.026	-.065	.027	-.075	.004	-.114	-.014	-.112	.166	.013	.056	-.116	.150	.058	.135	.078	.093	.156	.080	.01
94	-.071	-.019	-.043	-.140	.036	.093	-.067	-.275	.067	.077	-.110	-.062	-.034	.039	.096	-.001	.160	.066	-.008	.05
95	-.002	.324	.047	.109	-.145	.025	.199	.007	.084	.012	-.056	.140	-.010	.018	.086	-.025	.049	.242	.030	-.13

1

Table 5

Intercorrelations for Matrix B
Population = 88

	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
4	65																					
6	.234	66																				
9	-.119	.096	67																			
3	-.104	.012	.638	68																		
0	.213	.131	-.130	-.123	69																	
0	.050	.215	.032	-.023	.675	70																
3	.114	.102	-.015	-.030	.586	.471	71															
1	.131	.009	-.118	-.165	.393	.208	.189	72														
8	.140	.028	-.029	.003	.494	.418	.471	.542	73													
9	-.131	-.160	.034	.045	-.720	-.586	-.343	-.001	-.190	74												
8	.159	.024	-.089	-.093	.506	.364	.384	.868	.887	-.110	75											
8	.179	.210	-.034	.076	.458	.389	.287	-.035	.121	-.358	.055	76										
6	.159	.148	.055	-.105	.434	.463	.390	-.001	.317	.497	.186	.114	77									
3	-.187	-.200	-.022	-.024	-.535	-.489	-.493	.036	-.347	.556	-.186	-.410	-.817	78								
2	.077	.086	.012	.081	-.092	.001	-.006	.014	-.001	-.003	.010	-.105	.057	-.021	79							
6	.032	-.045	.065	-.036	-.284	-.233	-.250	.026	-.054	.177	-.016	-.456	.120	.176	.019	80						
8	.196	.201	-.071	-.099	.831	.754	.633	.526	.623	-.499	.657	.412	.353	-.434	-.079	-.306	81					
2	.009	.063	-.068	-.135	.325	.258	.218	.713	.414	.115	.636	-.022	-.201	.257	-.011	-.048	.604	82				
7	.260	.140	-.118	-.059	.736	.490	.459	.212	.369	-.552	.334	.319	.372	-.444	-.120	-.279	.633	.233	83			
4	.035	.016	-.055	-.012	372	.431	.253	.458	.391	.040	.486	.142	.018	-.018	.077	-.146	.572	.614	.210	84		
7	.153	.285	-.091	-.178	.466	.229	.439	.248	.384	-.297	.363	.143	.295	-.285	-.037	-.014	.507	.310	.314	.215	85	
3	-.083	.100	.146	.058	.081	.148	.130	-.027	.097	-.003	.037	.064	.103	-.088	-.099	.063	.113	.076	-.069	.130	-.027	8
2	-.132	.007	-.027	-.046	-.135	-.006	.014	-.021	-.072	-.016	-.054	-.120	.019	-.004	-.095	-.037	-.103	-.074	-.057	-.211	-.014	.0
0	.109	.027	-.016	-.084	-.003	-.102	-.019	.053	.036	.163	.049	.002	-.097	.139	.045	-.021	.035	.127	-.028	.068	.022	-.0
2	.120	.143	.050	.138	.010	.150	.112	-.132	-.003	.000	-.073	.038	.159	-.173	.071	.041	.155	.000	.062	.135	-.013	.2
8	-.040	-.033	.153	.204	-.070	.085	.102	.016	.114	.124	.071	-.030	.001	.015	-.038	.060	.026	.113	-.041	.029	-.162	.2
9	.136	.059	.024	.050	.006	-.050	.282	-.044	-.139	.070	-.106	.119	-.026	-.003	-.004	-.155	.110	.141	.147	.091	.109	.1
3	.095	.115	.114	.047	.116	.165	.264	-.136	-.098	-.094	-.134	.308	-.025	-.076	-.058	-.351	.221	.053	.267	.041	.038	.1
8	.093	.156	.080	.017	.010	.000	.013	-.166	-.157	-.073	-.187	-.001	-.005	.009	.034	.034	-.063	-.064	.153	-.054	.052	.0
1	.160	.066	-.008	.058	-.043	-.147	.138	-.077	-.123	.097	-.112	-.023	.024	-.052	-.130	-.070	-.048	.002	.140	-.017	.108	-.0
5	.049	.242	.030	-.132	.488	.396	.329	.402	.474	-.312	.499	.128	.154	-.187	-.149	-.102	.585	.408	.327	.315	.400	.2

2

75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
75																				
.055	76																			
.186	.114	77																		
-.186	-.410	-.817	78																	
.010	-.105	.057	-.021	79																
-.016	-.456	.120	.176	.019	80															
.657	.412	.353	-.434	-.079	-.306	81														
.636	-.022	-.201	.257	-.011	-.043	.604	82													
.334	.319	.372	-.444	-.120	-.279	.633	.233	83												
.486	.142	.018	-.018	.077	-.146	.572	.614	.210	84											
.363	.143	.295	-.285	-.037	-.014	.507	.310	.314	.215	85										
.037	.064	.103	-.088	-.099	.063	.113	.076	-.069	.130	-.027	86									
-.054	-.120	.019	-.004	-.095	-.037	-.103	-.074	-.057	-.211	-.014	.018	87								
.049	.002	-.097	.139	.045	-.021	.035	.127	-.028	.068	.022	-.063	-.135	88							
-.073	.038	.159	-.173	.071	.041	.155	.000	.062	.135	-.013	.244	-.141	.225	89						
.071	-.030	.001	.015	-.038	.060	.026	.113	-.041	.029	-.162	.293	.116	-.026	.272	90					
-.106	.119	-.026	-.003	-.004	-.155	.110	.141	.147	.091	.109	.127	-.016	.124	.291	-.042	91				
-.134	.308	-.025	-.076	-.058	-.351	.221	.053	.267	.041	.038	.168	-.017	.066	.307	.203	.589	92			
-.187	-.001	-.005	.009	.034	.034	-.063	-.064	.153	-.054	.052	.029	.139	-.136	.215	.087	.213	.352	93		
-.112	-.023	.024	-.052	-.130	-.070	-.048	.002	.140	-.017	.108	-.005	.038	.154	.205	-.042	.691	.430	.074	94	
.499	.128	.154	-.187	-.149	-.102	.585	.408	.327	.315	.400	.244	-.083	-.013	.055	.062	.040	.163	-.051	-.007	95

3

Table 6

Rotated Factors of Matrix B

Variable No.	Description of Variable	1	2	3	4	5	6	7	8
49	Total Testicular Volume	027	-122	057	-148	-035	236	-398	-251
50	Muscular Tonus	220	-116	250	090	156	296	100	055
51	General Bodily Cleanliness	066	-030	-018	-088	240	-058	066	070
52	Acne	-080	-220	052	-137	392	291	100	-012
53	Perspiration - Hands	072	102	-140	160	-242	-029	-098	-222
54	Perspiration - Axillary	096	212	-094	166	169	194	089	-201
55	Prominence of Larynx	140	-054	-290	108	-122	005	-252	174
56	Penis (Superior-Inferior Dimension)	184	-498	-097	083	102	-027	-416	262
57	Penis (Lateral Dimension)	184	-032	108	018	-024	110	-588	020
58	Varicocoele	128	169	-136	238	-028	-193	-063	227
59	Cremasteric Reflex	009	-025	-094	-223	-395	-146	-054	-066
60	Rhomberg	134	014	087	-261	338	-050	-090	036
61	Deep Reflexes	-042	079	-218	000	-538	136	-041	132
62	Tremors	-014	168	-168	112	121	224	359	124
63	General Body Hair Distribution	-007	-015	317	004	-540	159	114	-041
64	Pubic Hair Distribution	-008	-128	-019	-096	-144	512	-004	-068
65	Beard	088	156	212	272	-442	118	130	-157
66	Cerumen	081	206	170	-034	-044	299	161	022
67	Lymph Tissue Present	-072	038	-030	-726	050	107	-032	-033
68	Potential Lymph Tissue	-114	039	-024	-596	-158	-096	-098	052
69	Chest Circumference	456	020	796	090	060	-146	100	120
70	Calf Circumference	340	045	645	-089	-052	-088	086	208
71	Face Breadth	351	310	497	-012	-006	001	-076	-132
72	Hand Length	837	-106	010	101	-010	-100	-100	-060
73	Hand Breadth	700	-141	344	-039	-077	117	-080	-197
74	Disproportions	012	094	-832	-006	-070	020	-035	-215
75	Hand Area	897	-143	194	048	-060	004	-110	-186
76	Somatotype A - Endomorphy	023	266	445	-052	017	-392	276	-032
77	Somatotype B - Mesomorphy	-024	-038	694	089	-088	334	-176	-220
78	Somatotype C - Ectomorphy	063	-079	-823	-010	083	-120	110	262
79	Dysplasia	-018	-126	-030	-124	-336	009	102	-194
80	Masculine Component	-048	-288	-208	086	-084	492	-210	032
81	Weight	716	151	589	-025	-022	-113	158	066
82	Stature	842	101	-142	-038	-006	-095	071	112
83	Chest Depth	274	168	668	117	-042	-079	014	126
84	Bi-iliac	618	108	090	-028	-046	-140	140	040
85	Head Circumference	387	122	349	046	130	223	-044	-186
86	Resting Pulse (Navy Step Test)	101	208	016	-105	176	308	043	306
87	Endurance Time (Harvard Step Test)	-136	046	-045	-033	-029	-038	-334	-010
88	Pulse Increase After Endurance Test (Harvard Step Test)	118	133	-175	112	-220	027	244	-135
89	Pulse for 3.0-3.5 Minute Interval (Harvard Step Test)	004	376	076	-194	-332	304	239	110
90	Standing Pulse Rate (Schneider Index)	071	080	-064	-326	-210	144	-114	248
91	Standing Systolic Blood Pressure (Schneider Index)	044	816	-018	014	036	-036	-113	-044
92	Reclining Systolic Blood Pressure (Schneider Index)	-038	716	160	-220	-038	-097	158	158
93	Reclining Diastolic Blood Pressure (Schneider Index)	-166	274	098	-071	-232	132	-138	268
94	Standing Pulse Pressure (Schneider Index)	-056	660	-002	128	044	086	-160	-142
95	Hand Dynamometer (Reading No. 1 - Right Hand)	576	061	278	-048	118	207	058	264

the medical officers utilized the size of the genital organs as one of the factors in making a masculinity estimation. The positive loadings on variables 88 and 89, representing pulse changes on the Harvard Step Test, probably reflect the higher pulse rates after exercise found for the endomorphic individual who generally performs less well on tests of endurance as indicated by the significant negative loading for variable 87. No explanation can be offered by the author for the relationship between these variables (87, 88, and 89) and the size of the genitals. The factor is not well defined and does not probably warrant further study.

Physical Examination Factors. Factor 5 had its highest loadings on general body hair distribution (variable 63), deep reflexes (variable 61), and beard (variable 65) with additional negative loadings of decreasing significance on cremasteric reflex (variable 59), dysplasia (variable 79), pulse for 3-3.5 minute interval (variable 89), perspiration-hands (variable 53), reclining diastolic blood pressure (variable 93), pulse increase after exercise (variable 88), and standing pulse rate (variable 90). Two significant positive loadings on acne (variable 52) and Rhomberg (variable 60) were also present.* Although this factor is not well defined, the variables with the highest significant loadings suggest the designation physiological maturity. This term is derived principally from the loadings on general hair distribution, beard, and absence of acne, all of which are considered characteristics of the physiologically mature individual.

Factor 6 had significant positive loadings on the following measures listed in descending order of magnitude: pubic hair distribution (variable 64), masculine component (variable 80), mesomorphic component (variable 77), resting pulse per minute (variable 86), pulse for 3-3.5 minute interval (variable 89), cerumen (variable 66), muscular tonus (variable 50), acne (variable 52), total testicular volume (variable 49), tremors (variable 62), and head circumference (variable 85). A significant negative loading was found for the endomorphic component (variable 76). In general the pattern of loadings on this factor suggests items representing physical evidence for masculinity and the factor is so designated. Certainly the negative loading on the endomorphic measure supports this concept since individuals with this somatotype are not considered particularly masculine in appearance when com-

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* The positive sign on these two loadings are the result of a scoring artifact where a low score signifies no acne or no sway while a high score indicates the presence of excessive acne and the subject falling while taking the Rhomberg (see Figure F-3, Appendix F).

pared to the mesomorph. The lack of acne, good muscular tonus, large pubic hair distribution, large testicular volume, large head, etc. all tend to physically characterize the more masculine person.

Factor 4 is termed the lymph tissue factor because its highest loadings appeared on variables 67 and 68. Less significant negative loadings appeared on variables 90, 60, 59, and 92 with slightly significant positive loadings on variables 65 and 58; no biological significance is attached to these other variables.

Additional Factors. Factor 2 had highly significant positive loadings on standing systolic blood pressure (variable 91), reclining systolic blood pressure (variable 92), and standing pulse pressure (variable 94), with additional positive loadings of lesser significance on variables 89, 71, 93, 76, 54, 86, and 66. Significant negative loadings were found for variables 56, 80, and 52. This factor is named principally for its three highest loadings and the term blood pressure with endomorphic tendencies is suggested. It is logical that the endomorphic measure (variable 76) appears on this factor since this type of individual tends to have higher blood pressure and faster pulse rates arising from even very mild exercise such as standing from a reclining position (variable 90). Variables 89, 93, and 86 also represent other blood pressure and pulse measures. Axillary perspiration (variable 54) also would seem to be greater in the endomorph as would the inverse relation to masculine component (variable 80).

Since no obviously discernible pattern was noted in the loadings for factor 8, it probably represents a residual factor. Slightly significant positive loadings appeared on variables 86, 93, 95, 78, 56, 90, 58, and 70 with barely significant negative loadings on variables 49, 53, 77, 74, and 54. The factor probably does not warrant further study.

Matrix C

This matrix was composed of 39 variables (numbered from 96 through 134), representing 24 blood count ratios and 15 Rorschach measures taken from the records of Scorer K. These variables with their means and standard deviations are itemized in Table 7. The intercorrelations among these variables are shown in Table 8. Nine factors were extracted from these data, and their factor loadings are tabulated in Table 9.

Blood Factors. Factor 7 had highly significant negative loadings on the three polymorphonuclear leucocyte ratios obtained from the psychological stress situation (variables 96, 97, and 98). In addition, there was

Table 7

Summary of Variables for Matrix C With Their Means and Standard Deviations
Population = 88

Variable No.	Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
96	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal	P*	Percent of Basal Value	95.249	± 27.7382
97	Polymorphonuclear Leucocyte Ratio - Stress/Basal	P	Percent of Basal Value	109.548	± 32.1589
98	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal	P	Percent of Basal Value	111.235	± 33.2414
99	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal	T**	Percent of Basal Value	100.357	± 32.8759
100	Polymorphonuclear Leucocyte Ratio - Stress/Basal	T	Percent of Basal Value	141.226	± 45.9098
101	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal	T	Percent of Basal Value	151.706	± 48.5148
102	Eosinophil Ratio - Pre Stress/Basal	P	Percent of Basal Value	111.186	± 71.7092
103	Eosinophil Ratio - Stress/Basal	P	Percent of Basal Value	127.936	± 87.8781
104	Eosinophil Ratio - Post Stress/Basal	P	Percent of Basal Value	124.845	± 98.2655
105	Eosinophil Ratio - Pre Stress/Basal	T	Percent of Basal Value	108.080	± 94.2977
106	Eosinophil Ratio - Stress/Basal	T	Percent of Basal Value	78.215	± 61.3128
107	Eosinophil Ratio - Post Stress/Basal	T	Percent of Basal Value	100.634	± 96.7257
108	Basophil Ratio - Pre Stress/Basal	P	Percent of Basal Value	38.167	± 64.9242
109	Basophil Ratio - Stress/Basal	P	Percent of Basal Value	57.669	± 88.5083
110	Basophil Ratio - Post Stress/Basal	P	Percent of Basal Value	55.067	± 85.9538
111	Basophil Ratio - Pre Stress/Basal	T	Percent of Basal Value	53.111	± 86.8100
112	Basophil Ratio - Stress/Basal	T	Percent of Basal Value	43.874	± 78.3484
113	Basophil Ratio - Post Stress/Basal	T	Percent of Basal Value	57.478	±122.4310
114	Monocyte Ratio - Pre Stress/Basal	P	Percent of Basal Value	8.014	± 12.9151
115	Monocyte Ratio - Stress/Basal	P	Percent of Basal Value	8.052	± 14.1164
116	Monocyte Ratio - Post Stress/Basal	P	Percent of Basal Value	59.893	± 91.1714
117	Monocyte Ratio - Pre Stress/Basal	T	Percent of Basal Value	53.622	± 75.7148
118	Monocyte Ratio - Stress/Basal	T	Percent of Basal Value	56.057	± 81.8017
119	Monocyte Ratio - Post Stress/Basal	T	Percent of Basal Value	68.203	±109.1496
120	Total Responses (Rorschach - K)	P	Munroe's Check List	22.148	± 8.9102
121	Total Checks (Rorschach - K)	P	Munroe's Check List	10.716	± 4.7293
122	Total Stress Score (Rorschach - K)	P	Munroe's Check List	3.909	± 1.7788
123	Location (Rorschach - K)	P	Munroe's Check List	1.250	± 1.2058
124	Content (Rorschach - K)	P	Munroe's Check List	0.989	± 1.0449
125	Form (Rorschach - K)	P	Munroe's Check List	0.750	± 0.7915
126	Shading (Rorschach - K)	P	Munroe's Check List	1.011	± 1.0667
127	Movement (Rorschach - K)	P	Munroe's Check List	2.352	± 1.7554
128	Color (Rorschach - K)	P	Munroe's Check List	2.841	± 2.1861
129	FM + m[C_1 Stress] (Rorschach - K)	P	Munroe's Check List	0.102	± 0.3047
130	k + K[D] (Rorschach - K)	P	Munroe's Check List	0.057	± 0.2328
131	Fc + c[E] (Rorschach - K)	P	Munroe's Check List	0.659	± 0.7564
132	Fc + c[C_1 Stress] (Rorschach - K)	P	Munroe's Check List	0.170	± 0.4074
133	CF + C[I] (Rorschach - K)	P	Munroe's Check List	0.648	± 0.7587
134	Refusal (Rorschach - K)	P	Munroe's Check List	0.170	± 0.4347

* P = Psychological Stress.
** T = Tank Stress.

Variable No.	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
96	96															
97	.606	97														
98	.522	.655	98													
99	.249	.152	.143	99												
100	.172	.039	.118	.553	100											
101	-.063	-.053	-.105	.399	.721	101										
102	.121	.011	.021	.124	.072	.121	102									
103	.048	.159	-.034	.034	.125	.308	.543	103								
104	-.104	-.166	-.208	.120	.231	.453	.435	.501	104							
105	-.083	-.122	-.163	.049	.007	.060	.095	.068	-.009	105						
106	-.074	-.157	-.067	.115	-.005	-.087	-.051	-.013	-.100	.575	106					
107	-.055	-.099	-.001	.110	-.077	-.074	-.088	-.099	-.082	.543	.658	107				
108	.020	.038	.033	-.122	-.218	-.091	-.092	-.208	-.002	-.054	-.001	-.032	108			
109	-.236	-.036	-.125	.001	-.004	.078	-.176	-.012	-.127	-.046	.010	.133	.204	109		
110	-.091	.063	.035	.007	-.130	-.061	-.080	-.139	-.003	-.015	.055	.067	.525	.398	110	
111	-.040	-.079	.115	.199	.180	.006	-.134	-.083	-.077	.245	.280	.230	-.092	-.028	-.026	111
112	.003	-.068	.023	.120	-.085	-.118	-.092	-.024	-.040	.289	.387	.358	-.013	.021	.021	.621
113	-.107	-.116	.011	.097	.128	-.090	-.171	-.182	-.124	.324	.110	.336	-.066	.092	.160	.406
114	.089	.055	.012	-.015	.020	.006	-.097	-.260	-.160	-.019	-.025	-.031	.046	-.071	-.082	-.024
115	.038	-.023	.022	.170	.145	.043	-.183	-.140	-.073	.019	-.044	.043	-.080	.042	-.019	.234
116	.172	.079	.217	.062	.034	.019	-.111	-.185	-.149	-.046	-.059	.002	.091	-.030	.040	-.027
117	.006	-.105	-.021	-.050	.013	-.129	-.147	.040	-.065	.323	.297	.234	.049	-.081	-.130	.478
118	.007	-.053	.149	-.058	-.103	-.206	-.133	-.160	-.168	.034	.153	.170	.008	-.055	-.003	.271
119	.026	-.076	.023	-.035	.065	-.111	-.063	-.003	-.137	.345	.196	.092	-.096	-.050	-.155	.485
120	-.036	.041	.011	-.154	-.164	-.226	.050	-.007	-.177	-.176	-.158	-.225	-.163	.080	-.082	-.053
121	-.239	-.248	-.153	-.030	.092	.131	.067	.063	.095	.213	.305	.240	.163	-.006	-.027	.118
122	-.272	-.137	-.050	.007	.158	.148	-.069	-.006	.044	.209	.226	.104	.116	.118	.015	.173
123	-.065	-.137	-.127	-.055	.012	-.042	.022	-.092	.034	-.002	.123	-.032	-.117	.026	-.049	-.040
124	-.158	-.145	.024	-.069	.001	-.019	-.039	-.102	-.112	.170	.164	.165	.140	.083	.071	.208
125	-.195	-.032	-.076	-.156	-.100	-.055	-.135	.010	-.132	.124	.039	.025	-.024	.002	-.191	.050
126	-.230	-.132	-.184	-.136	-.001	.141	.024	.236	.144	.147	.077	.071	.127	.089	-.021	.152
127	-.185	-.014	.001	-.023	-.136	-.094	.071	.005	.025	-.031	.051	.132	.063	-.020	.096	-.089
128	-.069	-.211	-.114	.129	.203	.221	-.005	.045	.093	.275	.376	.253	.189	-.020	-.066	.198
129	-.048	.103	-.019	-.072	-.042	.032	.088	.056	.256	-.117	-.183	-.148	.070	-.071	.006	-.021
130	-.152	.009	-.045	-.141	.040	.115	.074	.177	-.055	-.094	-.153	-.144	-.023	-.032	-.054	.022
131	-.117	-.061	-.108	-.077	-.024	.081	-.029	.174	.047	.173	.102	.119	.080	.109	-.018	.085
132	-.160	-.126	-.137	.030	-.052	-.074	-.142	-.127	-.079	.138	.023	.119	-.057	.032	-.049	.037
133	.033	-.054	-.003	.076	.059	.068	.001	.063	.077	.208	.305	.303	.149	.121	-.074	.157
134	-.089	-.058	-.113	-.135	.067	.158	.067	.150	.068	.205	.080	.020	-.010	-.004	.073	.000

Table 8

Intercorrelations for Matrix C
Population = 88

1	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129
1																		
1	112																	
6	.292	113																
4	.018	.043	114															
4	-.006	.099	.169	115														
7	-.082	-.039	.635	.097	116													
8	.325	.231	-.080	.264	-.099	117												
1	.184	.094	.153	.106	.241	.331	118											
5	.189	.276	.033	.209	.038	.664	.371	119										
3	.072	-.090	.153	-.058	.073	-.207	.011	-.100	120									
8	.116	-.019	.069	.011	.022	.272	-.032	.199	-.177	121								
3	.127	.010	.083	.067	-.055	.300	.053	.254	-.056	.738	122							
0	.131	-.085	.185	.017	.109	.032	.135	.006	.438	.339	.332	123						
8	.129	.105	.075	-.077	.130	.161	.104	.124	.005	.467	.414	.230	124					
0	.095	-.080	.129	.059	.093	.284	.069	.256	.084	.500	.490	.199	.247	125				
2	.114	-.052	.006	.116	-.064	.278	.113	.074	-.195	.495	.528	.185	.237	.262	126			
9	-.058	-.105	.085	-.102	.072	-.046	-.094	-.011	-.261	.491	.169	-.064	.222	.221	.096	127		
8	.121	.054	-.073	.140	-.132	.342	-.101	.305	-.285	.667	.546	-.020	.009	.223	.198	.021	128	
1	-.039	-.055	.127	-.077	.053	.007	-.088	-.035	.244	-.028	.102	.086	-.032	-.036	-.004	-.004	-.096	129
2	-.119	-.030	.074	-.030	-.040	-.081	-.042	-.053	.334	.224	.235	.235	.097	.203	.183	-.021	.108	.241
5	.098	-.042	-.028	.098	-.017	.224	-.011	.043	-.277	.458	.378	.082	.257	.240	.874	.178	.168	-.146
7	.002	.082	.233	.228	.161	.203	.241	.113	-.077	-.034	.101	.053	.005	-.009	.392	-.069	-.072	-.049
7	.137	.004	-.014	.329	-.056	.331	.045	.286	-.149	.513	.385	.123	.125	.177	.261	.060	.652	-.141
0	-.051	.005	-.111	-.041	-.079	.090	-.040	.130	-.321	.214	.288	-.170	-.097	.192	.244	.071	.174	-.133

3

7	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134
7																	
1	118																
4	.371	119															
7	.011	-.100	120														
2	-.032	.199	-.177	121													
0	.053	.254	-.056	.738	122												
2	.135	.006	.438	.339	.332	123											
1	.104	.124	.005	.467	.414	.230	124										
4	.069	.256	.084	.500	.490	.199	.247	125									
8	.113	.074	-.195	.495	.528	.185	.237	.262	126								
6	-.094	-.011	-.261	.491	.169	-.064	.222	.221	.096	127							
2	-.101	.305	-.285	.667	.546	-.020	.009	.223	.198	.021	128						
7	-.088	-.035	.244	-.028	.102	.086	-.032	-.036	-.004	-.004	-.096	129					
1	-.042	-.053	.334	.224	.235	.235	.097	.203	.183	-.021	.108	.241	130				
4	-.011	.043	-.277	.458	.378	.082	.257	.240	.874	.178	.168	-.146	-.019	131			
3	.241	.113	-.077	-.034	.101	.053	.005	-.009	.392	-.069	-.072	-.049	-.103	.340	132		
1	.045	.286	-.149	.513	.385	.123	.125	.177	.261	.060	.652	-.141	.050	.189	.048	133	
0	-.040	.130	-.321	.214	.288	-.170	-.097	.192	.244	.071	.174	-.133	-.097	.214	-.166	.010	134

Table 9

Rotated Factors of Matrix C

Variable No.	Description of Variable	1	2	3	4	5	6	7	8	9
96	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (P)*	-224	-016	030	-101	-179	-029	-723	035	090
97	Polymorphonuclear Leucocyte Ratio - Stress/Basal (P)	-191	-172	072	028	066	025	-747	012	022
98	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (P)	-121	-060	-078	-018	-004	012	-772	078	-011
99	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (T)**	-072	196	-003	-612	-048	-002	-175	-016	053
100	Polymorphonuclear Leucocyte Ratio - Stress/Basal (T)	082	-042	062	-854	-083	-012	-110	032	022
101	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (T)	192	-097	270	-756	034	011	057	-143	060
102	Eosinophil Ratio - Pre Stress/Basal (P)	002	057	600	-080	-146	-019	-094	-191	-090
103	Eosinophil Ratio - Stress/Basal (P)	061	-042	774	-097	-045	030	-089	051	-004
104	Eosinophil Ratio - Post Stress/Basal (P)	086	-016	572	-342	-008	-009	201	-146	-015
105	Eosinophil Ratio - Pre Stress/Basal (T)	197	654	076	-008	-064	058	048	151	104
106	Eosinophil Ratio - Stress/Basal (T)	260	746	-056	045	-048	-042	-008	068	006
107	Eosinophil Ratio - Post Stress/Basal (T)	142	758	-104	035	059	032	-014	048	084
108	Basophil Ratio - Pre Stress/Basal (P)	232	-069	-168	152	456	-040	-120	-121	080
109	Basophil Ratio - Stress/Basal (P)	084	-014	-156	-058	502	003	143	-009	-004
110	Basophil Ratio - Post Stress/Basal (P)	-018	032	-156	-020	724	-008	-058	-156	042
111	Basophil Ratio - Pre Stress/Basal (T)	066	346	-090	-228	100	018	-074	632	-144
112	Basophil Ratio - Stress/Basal (T)	055	512	-026	006	136	028	-073	370	-232
113	Basophil Ratio - Post Stress/Basal (T)	-090	355	-202	-153	180	-023	068	285	-040
114	Monocyte Ratio - Pre Stress/Basal (P)	073	-038	-424	-083	-208	439	-132	-154	-167
115	Monocyte Ratio - Stress/Basal (P)	056	-088	-241	-208	-087	076	048	355	120
116	Monocyte Ratio - Post Stress/Basal (P)	027	-044	-396	-114	-164	496	-262	-196	-078
117	Monocyte Ratio - Pre Stress/Basal (T)	279	202	-033	040	-126	052	034	702	102
118	Monocyte Ratio - Stress/Basal (T)	-030	112	-206	081	-094	298	-038	360	-084
119	Monocyte Ratio - Post Stress/Basal (T)	218	140	-140	-036	-232	018	-024	622	084
120	Total Responses (Rorschach - K)	-133	-185	-074	156	-044	-072	004	-002	-725
121	Total Checks (Rorschach - K)	975	142	010	008	-094	-006	040	-084	-012
122	Total Stress Score (Rorschach - K)	834	-006	-041	-062	054	046	038	153	-119
123	Location (Rorschach - K)	288	-004	-050	030	-124	148	068	-014	-562
124	Content (Rorschach - K)	422	171	-136	048	096	192	-030	-044	-216
125	Form (Rorschach - K)	512	-098	-117	166	-177	082	006	150	-026
126	Shading (Rorschach - K)	563	-062	344	108	248	531	129	276	054
127	Movement (Rorschach - K)	334	047	-009	119	-059	080	-012	-282	174
128	Color (Rorschach - K)	642	206	-018	-144	-082	-398	-015	204	193
129	FM + m [C_1 Stress] (Rorschach - K)	-024	-152	124	-018	-003	006	-014	-049	-364
130	k + K[D] (Rorschach - K)	269	-256	078	011	018	-097	-008	018	-446
131	Fc + c[E] (Rorschach - K)	475	026	248	116	202	509	071	156	253
132	Fc + c [E_1 Stress] (Rorschach - K)	-026	052	-116	026	-054	514	233	206	034
133	CF + C[I] (Rorschach - K)	522	178	-034	-084	-070	-180	-066	264	116
134	Refusal (Rorschach - K)	244	004	178	020	100	-002	-013	048	375

* P = Psychological Stress.

** T = Tank Stress.

a barely significant negative loading on one of the psychological stress monocyte ratios (variable 116) and two barely significant positive loadings on variables 132 and 104, representing a Rorschach measure and an eosinophil ratio obtained from the psychological stress, respectively. Since the loadings on these last three variables were so low in contrast to variables 96, 97, and 98, they are not considered to be of any significant biological consequence, and thus the factor is labeled <u>the change in polymorphonuclear leucocyte ratios resulting from the psychological stress situation</u>. Reference to the means listed in Table 7 indicates that the polymorphonuclear leucocyte counts showed an increase for the stress and post-stress samples as contrasted to the basal value whereas the pre-stress sample showed a 5 per cent decrease in count as compared to the basal value. The slight increase noted in the standard deviations reflects slightly greater variability in counts for the stress and post-stress samples.

Factor 4 had highly significant negative loadings on variables 99, 100, and 101 which represent the various polymorphonuclear leucocyte ratios obtained for the tank stress situation. In addition, barely to slightly significant negative loadings were found for the eosinophil ratio-post stress/basal obtained for the psychological stress (variable 104), for a basophil ratio--pre-stress/basal obtained for the tank stress (variable 111) and for a monocyte ratio--stress/basal obtained from the psychological stress (variable 115). The label assigned this factor is derived from the variables which have the highest loadings (99, 100, and 101) and is termed <u>the change in polymorphonuclear leucocyte ratios resulting from the tank stress situation.</u> Referring back to the means in Table 7, it is noted that in comparison to the basal value, there was essentially no change in count obtained for the pre-stress value, a 41 per cent increase in the stress sample count, and a 52 per cent increase in the post-stress count. The marked increase in the standard deviations for the stress and post-stress ratios reflect the great variability in response to this situation.

Factor 5 had its highest positive loadings on variables 108, 109, and 110, the three basophil ratios obtained for the psychological stress situation. Additional barely significant positive loadings were found for two Rorschach measures (variables 126 and 131) with barely significant negative loadings obtained for two monocyte ratios (variables 119 and 114). The factor is labeled <u>the change in basophil ratios resulting from the psychological stress situation</u>. Examination of the means and standard deviations shown in Table 7 for variables 108, 109, and 110 indicates that the pre-stress, stress, and post-stress samples had counts which were only approximately one-half that obtained for the basal sample. The large standard deviations reflect the great variability characteristic of these measures.

Factor 2 had its highest positive loadings on the tank stress situation measures for the eosinophil and basophil ratios (variables 107, 106, 105, 112, 113, and 111 listed in decreasing order of magnitude). Additional positive loadings of borderline significance were found for a Rorschach measure (variable 128) and for a monocyte ratio (variable 117), with a barely significant negative loading on variable 130, a Rorschach measure. The loadings found for variables 128, 117, and 130 are not considered to be of biological significance, and the factor is labeled <u>the change in eosinophil and basophil ratios resulting from the tank stress situation.</u>

Referring to the means and standard deviations in Table 7, it is noted that no consistent pattern of change in the means was evident for the eosinophil ratios. The pre-stress value was approximately 8 per cent higher and the stress count about 22 per cent lower than the basal value, with essentially equal counts for the post-stress and basal measures. The large standard deviations attest to the great variability present in these responses. In the case of the basophil ratios (variables 111, 112, and 113), the pre-stress, stress and post-stress counts were approximately one-half that found for the basal value with the usually high variability present. In the case of the basophil ratios, the response to both types of stresses was essentially equal.

Factor 3 had its highest positive loadings on variables 102, 103, and 104, representing the eosinophil ratios resulting from the psychological stress situation. Significant negative loadings were found for variables 114, 115, and 116 which are the monocyte ratios resulting from this same stress situation. In addition, positive loadings of lesser significance were found for two Rorschach variables (126 and 131) and for a polymorphonuclear leucocyte ratio (variable 101). Additional, barely significant negative loadings were found for a monocyte ratio (variable 118) and for a basophil ratio (variable 113), both being for the tank stress situation. The factor is consequently labeled <u>the contrast between the eosinophil and monocyte ratios resulting from the psychological stress situation.</u>

Reference to the means and standard deviations contained in Table 7 indicates that slight increases in the eosinophil counts over the basal values occurred for the pre-stress, stress, and post-stress samples while marked decreases occurred in the case of the monocyte ratios for the same comparisons. Thus there was an inverse relationship between the eosinophil and monocyte counts resulting from this stress situation which was reflected by the opposite signs on the loadings for these two blood components.

Factor 8 had significant positive loadings on variables 117, 118, and 119, representing the monocyte ratios resulting from the tank stress situation as well as significant loadings on variables 111, 112, and 113 which are the tank stress basophil ratios. In addition, less significant positive loadings were found for variable 116 (monocyte-stress/basal for the psychological stress) and for several of the Rorschach measures (variables 126, 133, 132, and 128 listed in decreasing order of magnitude). A barely significant negative loading was found for Rorschach movement measure (variable 127). Since the Rorschach variables appeared not to have any particular pattern formation and because of their low order significance, they were not considered to be of psychological importance. The factor was termed the change in monocyte and basophil ratios resulting from the tank stress situation. The means and standard deviations shown in Table 7 for variables 117, 118, 119, 111, 112, and 113 indicate that the counts for both the monocytes and basophils decreased in the pre-stress, stress, and post-stress samples as compared to the basal value. The large standard deviations reflect the great variability in response to this stress.

Rorschach (K) Factors. In general the Rorschach factors were much less well defined than those obtained for the various blood cell studies. Thus the labeling of the factors is considered extremely tentative and certainly subject to change by psychologists experienced in these projective techniques.

Factor 1 had highly significant positive loadings on the following Rorschach measures: variables 121, 122, 128, 126, 133, 125, 131, and 124. Additional positive loadings of lesser significance were found for variables 127, 123, 117, 130, 106, 134, 108, and 119. A single negative loading of low significance was found for one of the polymorphonuclear leucocyte ratios (variable 96). The underlined variable numbers represent various blood cell ratios which fail to indicate any intelligible trend and thus are not considered to be of any physiological significance. The pattern that appears among the Rorschach variables tends to be similar to that found in poorly adjusted individuals. This interpretation is based largely on the loadings found for variables 128, 133, 125, and 131, representing the responses to color and color-form combinations. Phillips and Smith (58) state, "At least in part, the adjustment techniques of the adult who gives a number of pure C responses are fixated at, or have regressed to, an immature level. Such an individual is likely to be self-centered and demanding, and impatient at delay in immediate gratifications." Thus this factor is tentatively labeled tendency to poor adjustment (Rorschach).

Factor 9 had significant negative loadings on total responses (variable 120), location (variable 123), and k + K (variable 130), with additional negative loadings for FM + m (C_1 Stress) (variable 129), a basophil ratio (variable 112), and for content (variable 124). Positive loadings on refusal (variable 134) and on Fc + c (E) (variable 131) were also present. The Rorschach pattern evident in this factor is characteristic of the response record noted for guarded individuals. Phillips (58) states that "Guarded normals virtually never produce less than ten responses. Guarded psychopaths sometimes develop only one or two responses, sometimes reject all ten cards. Guarded individuals in other diagnostic groups show no characteristic restrictions of response although in general, the greater the reduction, the more severe the pathology." It has been observed that anxiety is a common personality attribute of all individuals who develop guarded records. Thus the Rorschach pattern evident in this factor suggests labeling it as <u>a tendency toward a guarded or defensive personality</u>.

Factor 6 is a poorly defined factor. It had significant positive loadings on shading (variable 126), (Fc + c [E_1 Stress]) (variable 132), (Fc + c [E]) (variable 131), and on three blood cell ratios (variable 116, 114, and 118). A slightly significant negative loading was found on color (variable 128). Possibly this factor represents the difference between the skin and major sense type of responsiveness observed in Rorschach analyses - for example, the tactile type individual who experiences pleasure from stroking velvet as opposed to the individual who experiences pleasure from looking at pictures or listening to music. Thus this factor might be tentatively labeled as <u>skin versus major sense type of responsiveness</u>.

<u>Matrix D</u>

This matrix is composed of 34 variables representing items from the personal interview and from the Rorschach records interpreted by scorer S. The variables (numbered from 135 through 164) are itemized with their means and standard deviations in Table 10. The intercorrelations for these 34 variables are shown in Table 11. Seven factors were extracted from these intercorrelations; these are shown with their factor loadings in Table 12.

Factor 1 had significant positive loadings on both the personal interview and Rorschach variables. In decreasing order of magnitude they were found on variables 144, 146, 136, 145, 143, 135, 159, 153, 138, and 141. A negative loading of slight significance was found for m% (variable 150). The highest loadings appeared on items from the

Table 10

Summary of Variables for Matrix D With Their Means and Standard Deviations
Population = 88

Variable No.	Description of Variable	Unit of Measurement	Mean	Standard Deviation.
135	Appearance and Manner (E)	5-Point Scale	3.398	± 0.5579
136	Appearance and Manner (K)	5-Point Scale	3.705	± 0.5705
137	Family History (E)	5-Point Scale	3.432	± 0.5631
138	Family History (K)	5-Point Scale	3.500	± 0.7878
139	Psychological and Social Maturity (E)	5-Point Scale	3.352	± 0.5475
140	Psychological and Social Maturity (K)	5-Point Scale	3.784	± 0.5959
141	Leadership (E)	5-Point Scale	3.307	± 0.4880
142	Leadership (K)	5-Point Scale	3.625	± 0.6309
143	Participation in Athletics (E)	5-Point Scale	3.216	± 0.4407
144	Participation in Athletics (K)	5-Point Scale	3.864	± 0.6978
145	Attitude toward Rough Sports (E)	5-Point Scale	3.227	± 0.4729
146	Attitude toward Rough Sports (K)	5-Point Scale	3.659	± 0.5850
147	Total Responses (Rorschach - S)	Total Number	22.375	± 8.9844
148	M% (Rorschach - S)	Percent of Total Responses	10.185	± 7.7040
149	FM% (Rorschach - S)	Percent of Total Responses	18.110	±10.9874
150	m% (Rorschach - S)	Percent of Total Responses	2.491	± 3.8206
151	k% (Rorschach - S)	Percent of Total Responses	0.636	± 2.2679
152	K% (Rorschach - S)	Percent of Total Responses	5.284	±14.6389
153	FK% (Rorschach - S)	Percent of Total Responses	2.849	± 4.0847
154	F% (Rorschach - S)	Percent of Total Responses	41.425	±17.7538
155	Fc% (Rorschach - S)	Percent of Total Responses	6.025	± 6.2958
156	c% (Rorschach - S)	Percent of Total Responses	3.049	± 4.8504
157	C'% (Rorschach - S)	Percent of Total Responses	1.738	± 3.8698
158	FC (Rorschach - S)	Percent of Total Responses	7.330	± 6.3873
159	CF (Rorschach - S)	Percent of Total Responses	5.207	± 6.4301
160	C (Rorschach - S)	Percent of Total Responses	0.367	± 1.8606
161	W% (Rorschach - S)	Percent of Total Responses	36.545	±21.5273
162	D% (Rorschach - S)	Percent of Total Responses	48.477	±16.2389
163	d% (Rorschach - S)	Percent of Total Responses	6.477	± 7.3108
164	rd% (Rorschach - S)	Percent of Total Responses	8.455	± 9.3819

Table 11

Intercorrelations for Matrix D
Population = 88

Variable No.	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153
135	135																		
136	.301	136																	
137	.252	.044	137																
138	.301	.307	.415	138															
139	.063	.190	-.089	.040	139														
140	.088	.250	.041	.135	.447	140													
141	.138	.247	.056	.015	.236	.072	141												
142	.102	.264	.073	.243	.121	.027	.527	142											
143	.348	.257	-.010	-.017	.158	.092	.276	.005	143										
144	.200	.562	-.053	.230	.067	.150	.259	.248	.396	144									
145	.307	.380	.016	.093	.220	.135	.342	.096	.534	.374	145								
146	.279	.556	.033	.150	.164	.182	.250	.086	.467	.673	.408	146							
147	.179	-.131	.174	.084	.034	-.156	-.087	.058	-.076	-.056	.102	-.083	147						
148	-.025	.044	.071	.071	.064	.047	.159	.075	.055	-.031	.013	-.016	-.125	148					
149	-.015	-.023	.026	.143	.015	.100	.186	.251	-.059	-.007	-.037	-.111	-.242	.125	149				
150	-.057	-.011	-.031	.022	.074	.039	.021	.104	.030	-.165	-.122	-.100	-.005	.181	.096	150			
151	-.135	-.168	-.290	-.239	-.112	-.144	-.106	-.174	.169	.141	-.029	.025	.079	-.169	-.133	-.166	151		
152	.003	.021	.265	.148	-.083	-.166	-.197	-.068	-.111	.101	-.139	-.148	.307	-.034	-.188	-.101	.127	152	
153	.108	.067	-.083	.035	-.018	.088	.095	.097	.052	.296	.023	.200	.088	.008	.048	-.163	.009	.073	153
154	-.103	-.226	-.121	-.146	-.046	-.129	-.334	-.263	-.194	-.147	-.170	-.134	.283	-.439	-.500	-.189	.141	.058	-.220
155	.098	.111	.029	.010	-.014	.014	.179	.116	.023	-.055	.148	-.015	-.008	-.099	-.012	.113	-.182	-.103	-.038
156	.124	.019	.015	.025	.015	.115	-.075	-.181	.123	.006	.262	.091	-.107	.004	-.091	-.161	.069	.020	.022
157	.114	.186	.066	-.091	.065	-.141	.204	-.006	.327	.070	.160	.257	-.043	.183	-.185	-.031	-.058	-.041	-.031
158	.014	.196	.142	.046	-.107	.066	.013	.156	-.143	-.020	-.109	.094	-.181	-.053	-.056	-.153	-.045	-.095	-.204
159	.087	.139	.133	.113	.126	.052	.113	.013	.282	.276	.266	.159	-.054	-.153	-.209	-.122	-.034	.123	.149
160	-.076	.103	-.142	-.191	-.048	.084	.054	.060	-.014	.039	-.018	.064	-.087	-.209	-.058	.033	-.007	.080	.078
161	-.037	.144	-.038	-.052	.054	.033	.221	.077	.252	.094	.171	.034	-.492	.307	.190	.047	-.014	-.038	-.077
162	-.038	-.263	-.001	-.023	-.121	-.140	-.225	-.114	-.360	-.146	-.290	-.205	.251	-.271	-.060	-.144	.011	.010	.043
163	.260	.018	.002	.052	.064	.108	.049	.019	.200	.132	.161	.181	.390	-.208	-.150	-.093	.138	.053	.135
164	-.064	.098	.073	.114	.036	.088	-.166	.006	-.132	-.078	-.016	.117	.384	-.066	-.217	.210	-.092	.013	-.002

Table 11

Intercorrelations for Matrix D
Population = 88

145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164
145																			
.408	146																		
.102	-.083	147																	
.013	-.016	-.125	148																
-.037	-.111	-.242	.125	149															
-.122	-.100	-.005	.181	.096	150														
-.029	.025	.079	-.169	-.133	-.166	151													
-.139	-.148	.307	-.034	-.188	-.101	.127	152												
.023	.200	.088	.008	.048	-.163	.009	.073	153											
-.170	-.134	.283	-.439	-.500	-.189	.141	.058	-.220	154										
.148	-.015	-.008	-.099	-.012	.113	-.182	-.103	-.038	-.372	155									
.262	.091	-.107	.004	-.091	-.161	.069	.020	.022	-.318	.060	156								
.160	.257	-.043	.183	-.185	-.031	-.058	-.041	-.031	-.315	.090	.219	157							
-.109	.094	-.181	-.053	-.056	-.153	-.045	-.095	-.204	-.096	.009	-.194	.087	158						
.266	.159	-.054	-.153	-.209	-.122	-.034	.123	.149	-.282	.103	.321	.079	-.136	159					
-.018	.064	-.087	-.209	-.058	.033	-.007	.080	.078	-.010	.123	.053	-.032	-.180	.025	160				
.171	.034	-.492	.307	.190	.047	-.014	-.038	-.077	-.513	-.010	.353	.170	-.006	.387	.094	161			
-.290	-.205	.251	-.271	-.060	-.144	.011	.010	.043	.401	-.009	-.234	-.124	.051	-.408	-.028	-.803	162		
.161	.181	.390	-.208	-.150	-.093	.138	.053	.135	.277	.091	-.225	-.124	-.180	.008	-.156	-.507	.119	163	
-.016	.117	.384	-.066	-.217	.210	-.092	.013	-.002	.263	-.016	-.229	-.088	.079	-.197	-.049	-.515	.032	.169	164

Table 12

Rotated Factors of Matrix D

Variable No.	Description of Variable	1	2	3	4	5	6	7
135	Appearance and Manner (E)	316	050	-066	-320	009	-334	-014
136	Appearance and Manner (K)	668	-104	054	-245	-244	-038	160
137	Family History (E)	056	023	-026	-618	124	040	-028
138	Family History (K)	245	023	-210	-576	010	110	-058
139	Psychological and Social Maturity (E)	066	-024	-067	014	-470	-240	-097
140	Psychological and Social Maturity (K)	160	-050	-136	-015	-522	020	-049
141	Leadership (E)	242	-209	-414	-047	-187	-410	052
142	Leadership (K)	160	-062	-470	-246	-159	-072	022
143	Participation in Athletics (E)	395	-228	071	092	015	-610	018
144	Participation in Athletics (K)	837	-014	-178	063	072	-052	-092
145	Attitude toward Rough Sports (E)	404	-125	065	-086	-126	-540	-092
146	Attitude toward Rough Sports (K)	758	-024	039	013	-124	-200	158
147	Total Responses (Rorschach - S)	-100	521	053	-305	112	-198	-305
148	M% (Rorschach - S)	-128	-402	-155	-176	032	-056	168
149	FM% (Rorschach - S)	-062	-281	-606	-023	-045	154	133
150	m% (Rorschach - S)	-244	-090	-017	-132	-296	-021	076
151	k% (Rorschach - S)	041	114	044	421	370	-071	-117
152	K% (Rorschach - S)	050	107	091	-228	298	164	-352
153	FK% (Rorschach - S)	269	040	-276	044	016	092	-298
154	F% (Rorschach - S)	-097	752	282	322	078	050	-052
155	Fc% (Rorschach - S)	-002	-087	022	-204	-210	-132	052
156	c% (Rorschach - S)	120	-396	275	-018	046	-079	-221
157	C'% (Rorschach - S)	156	-251	210	-088	067	-290	204
158	FC (Rorschach - S)	136	038	020	-147	068	191	460
159	CF (Rorschach - S)	285	-284	162	-090	000	-126	-478
160	C (Rorschach - S)	168	-043	144	206	-258	216	-178
161	W% (Rorschach - S)	070	-933	089	080	092	-052	-180
162	D% (Rorschach - S)	-134	632	-122	082	086	190	196
163	d% (Rorschach - S)	104	533	-148	-027	-010	-388	-198
164	rd% (Rorschach - S)	-033	422	204	-232	-230	092	096

personal interview concerned with the subject's participation in athletics, attitudes toward rough sports, and his appearance and manner, all of which might be considered related to masculine activities. The Rorschach pattern on this factor tends to characterize the overtly extroverted individual ("back slapper" type) and thus tends to support the personal interview findings. The factor is thus labeled tendency toward masculine activity.

Factor 2 had significant negative loadings on W% (variable 161), M% (variable 148), c% (variable 156), CF (variable 159), FM% (variable 149), C'% (variable 157), participation in athletics (E) (variable 143), and leadership (E) (variable 141). Significant positive loadings were found for F% (variable 154), D% (variable 162), d% (variable 163), total responses (variable 147), and rd% (variable 164). The Rorschach factor pattern noted here is suggestive of the anti-intellective type of person who has a compulsion to look at details in contrast to the individual who is more concerned with the total picture. This factor might be tentatively labeled as a tendency toward petty interests.

Factor 3 had significant negative loadings on FM% (variable 149), leadership (K) and (E) (variables 142 and 141), FK% (variable 153), and family history (K) (variable 138). Additional positive loadings of slight significance were found for F%, c%, C'%, and rd% representing variables 154, 156, 157, and 164, respectively. The pattern of Rorschach responses present on this factor would tend to characterize those individuals who have a tendency to be depressed or dysphoric - in other words, a person who tends to be impatient or restless with some indications of mental anxiety. Thus the factor is termed tendencies toward depression.

Factor 4 had significant negative loadings on family history (interviewers E and K) (variables 137 and 138), appearance and manner (interviewers E and K) (variables 135 and 136), total responses (variable 147), leadership (interviewer K) (variable 142) and on rd%, K%, and Fc% (variables 164, 152, and 155). Significant positive loadings were found for k%, F%, and C representing variables 151, 154, and 160. The Rorschach response pattern in this factor would seem to be that characteristic of persons having a neurotic preoccupation. This factor is tentatively termed the tendency to neurotic preoccupation.

Factor 5 had significant negative loadings on the following personal interview items: psychological and social maturity (interviewers E and K) (variables 139 and 140), and on appearance and manner (interviewer K) (variable 136). Significant negative loadings were found on such Rorschach measures as m%, C, rd%, and Fc% representing variables 150, 160, 164, and 155, respectively. Positive loading

on k% and K% (variables 151 and 152) were also found. The pattern here appears characteristic of those individuals with a certain sense of detachment from their social environment and a tendency to demonstrate a certain denial of emotionality. The factor is tentatively termed the tendency to show a denial of emotionality.

There appears to be a contrast between factors 4 and 5 with persons whose Rorschach pattern approximates factor 4 being more extroverted and those individuals with patterns similar to factor 5 having more intellectual qualities.

Factor 6 had significant negative loadings on the following items from the personal interview: participation in athletics (E) (variable 143), attitude toward rough sports (E) (variable 145), leadership (E) (variable 141), appearance and manner (E) (variable 135), psychological and social maturity (E) (variable 139), and attitude toward rough sports (K) (variable 146). Significant negative loadings were also found for d% and C'% representing Rorschach variables 163 and 157, respectively. A positive loading of borderline significance was found for C (variable 160). The Rorschach pattern in evidence here suggests those individuals who attempt to eliminate evidences of compulsivity in their responses - "the small d types." There is also a suggestion of the dysphoric individual as evidenced by an under-responsiveness or an overcontrolling of answers. The factor is thus termed a tendency to eliminate evidence of compulsivity.

Factor 7 had significant negative loadings on CF, K%, total responses, FK%, and c% representing variables 159, 152, 147, 153, and 156, respectively, and significant positive loadings for FC and C'% (variables 158 and 157, respectively). The pattern is suggestive of individuals having a tendency toward a controlled emotionality. Phillips (58) states that "the FC response occurs from very early age levels and normally becomes dominant over other uses of color in the post adolescent period. . . . The exclusive use of FC in response to color, with C or CF responses absent, is characteristic of the individual whose interpersonal relationships are tense and formal, and who, though in actuality not well integrated into society, gives the impression of being overcompliant. He is the individual who feels it pays to conform. Thus, the exclusive presence of FC indicates a failure to make close contacts despite an anxious striving for such relationships." Accordingly, the factor is labeled as the tendency to exhibit a controlled emotionality.

Rotated Second Order Factors of Scores

As mentioned in the section on Statistical Analysis, the loadings making up the 33 extracted factors discussed above were used to compute 33 scores for each subject. These scores were used as new variables, correlations computed, and a second factor extraction performed. Seven rotated factors accounted for almost all variation; these are shown in Table 13. This procedure represents an intermediate step between the data contained in Tables 1-12 and Table 14 and also seems to indicate the interrelationships between matrices A, B, C, and D. No attempt will be made to discuss these seven factors in detail since their second-order characteristic makes any practical predictions quite tenuous. In general, factors 1, 2, 3, and 4 represent loadings obtained for the original matrices A, C, B, and D, respectively. Factors 5, 6, and 7 tend to indicate the intermatrices' relationships, having loadings on factors from all four matrices.

Rotated Factors from the Original 164 Variables

Since the seven second-order factors listed in Table 13 were in terms of the 33 first-order factors, multiplications were required to convert back to the original 164 variables. In other words, correlations were computed between the seven new factors and the original 164 variables. Finally the seven factors of 164 variables each were rotated by the quartimax procedure (55). These rotated factors are presented in Table 14.

The subjects of these experiments, submarine enlisted candidates, were a highly selected group, particularly with respect to physical and physiological characteristics. It appears that self-selection occurred in the case of many of the variables not specifically used as criteria of selection. This, as well as the fact that many more variables than subjects were examined, must be kept in mind when interpreting the results of the factor analyses. The seven factors extracted are difficult to interpret, partly for the above reasons, and also because of the peculiar juxtaposition of unrelated variables.

17-Ketosteroid Factors. Factor 1 had highly significant positive loadings on variables 16, 17, and 18, representing the three 17-ketosteroid ratios resulting from the tank stress situation. Moderately significant positive loadings occurred for the personal history score (variable 45), the schizophrenia scale of the MMPI (variable 38), and for the arithmetic reasoning value (variable 41). Additional positive and negative

loadings ranging from borderline to slight significance were found for 17 other variables representing measures from the MMPI, Rorschach tests, physical fitness area, anthropometry, blood counts, etc. Since the separation in the magnitude of the loadings between variables 16, 17, 18 and the others is so marked, the factor is labeled as the change in 17-ketosteroid ratios resulting from the tank stress situation.

Factor 5 had significant positive loadings on variables 13, 14, and 15 representing the three 17-ketosteroid ratios resulting from the psychological stress situation. A significant negative loading for the 17-ketosteroid output (variable 27) also occurred. The opposite sign is simply an arithmetic artifact previously discussed under factor 5 of Matrix A. A total of 30 additional variables representing measures from many different areas had loadings from borderline to slight significance on this factor. However, apart from the 17-ketosteroid measures, no clearly defined pattern of response was noted. Thus the factor is termed the change in 17-ketosteroid ratios resulting from the psychological stress situation.

Physique Factor. Factor 3 had significant loadings on a variety of measures which are directly related to body build or a size-strength configuration. Listed in descending order of magnitude, the variables with positive loadings included chest circumference (variable 69), mesomorphic component (variable 77), weight (variable 81), calf circumference (variable 70), chest depth (variable 83), face breadth (variable 71), hand breadth (variable 73), head circumference (variable 85), hand dynamometer score (variable 95), endomorphic component (variable 76), and hand area (variable 75). In addition, highly significant negative loadings appeared on number of disproportions (variable 74) and the ectomorphic component (variable 78). Related to the physical anthropometric pattern were certain variables indicative of the masculinity estimates. These included such measures as appearance and manner (interviewers E and K) (variables 135 and 136), attitude toward rough sports (E and K) (variables 145 and 146), participation in athletics (E and K) (variables 143 and 144), psychological and social maturity (E and K) (variables 139 and 140), leadership (E and K) (variables 141 and 142), general body hair distribution (variable 63), muscular tonus (variable 50), and beard (variable 65). Negative loadings on such measures as personal history (variable 45), psychasthenia (variable 37), hypochondriasis (variable 31), and depression (variable 32), all tended to reinforce the masculinity pattern. Since the masculinity estimates utilized in this study were in large measure based on physical aspects, it is considered logical that these items would appear on the same factor. Thus this factor is termed size-strength with masculinity overtones.

Table 13

Rotated Second Order Factors of Scores

Matrix Designation	Factor No.	1	2	3	4	5	6	7
A	1	924	-001	083	-054	058	053	205
A	2	-779	030	179	-035	-138	-015	176
A	3	-498	-064	-319	124	315	-144	-251
A	4	365	000	-025	014	-567	084	044
A	5	478	-040	039	099	571	-065	-081
A	6	-828	-030	-120	141	042	121	067
A	7	873	-035	119	-112	-247	040	056
A	8	-011	-148	343	-235	057	-238	-081
A	9	-758	021	-127	-172	-164	-042	192
B	1	-060	-101	870	-076	-007	009	031
B	2	079	093	-659	134	-036	-057	-255
B	3	-029	-129	694	028	-338	067	-291
B	4	064	-153	716	022	170	-322	161
B	5	187	-084	160	120	201	-053	122
B	6	-065	-048	410	065	-126	458	-174
B	7	123	048	162	142	-142	-195	-227
B	8	-065	073	429	-126	147	398	104
C	1	-070	-845	-089	158	-025	-029	-062
C	2	058	417	169	-018	009	334	-048
C	3	-077	-373	-051	142	262	329	041
C	4	176	476	-035	267	374	104	-014
C	5	-012	754	102	-077	124	-080	033
C	6	015	058	148	209	-168	-317	-192
C	7	191	336	142	091	-256	457	154
C	8	036	-464	-154	175	122	329	-168
C	9	-070	-006	-052	-071	146	295	-096
D	1	141	-077	356	748	102	-026	019
D	2	-139	022	101	-741	-205	031	-145
D	3	-034	-414	-051	446	-127	-269	188
D	4	-221	037	112	-491	418	068	-057
D	5	-058	357	336	-258	253	037	-400
D	6	149	260	019	027	125	072	-595
D	7	-219	113	-055	-569	138	-100	221

Table 14

Rotated Factors - Original 164 Variables

Variable No.	Description of Variable	1	2	3	4	5	6	7
01	Total Leucocyte Count Ratio - Pre Stress/Basal (P)*	052	194	194	-084	150	016	218
02	Total Leucocyte Count Ratio - Stress/Basal (P)	-028	191	-040	-008	077	-064	099
03	Total Leucocyte Count Ratio - Post Stress/Basal (P)	-004	116	-089	034	220	006	090
04	Total Leucocyte Count Ratio - Pre Stress/Basal (T)**	046	-074	168	-016	-081	-163	338
05	Total Leucocyte Count Ratio - Stress/Basal (T)	-084	-159	205	-010	-094	018	284
06	Total Leucocyte Count Ratio - Post Stress/Basal (T)	-019	-147	036	128	-068	-146	150
07	Total Lymphocyte Count Ratio - Pre Stress/Basal (P)	072	066	004	036	137	-052	307
08	Total Lymphocyte Count Ratio - Stress/Basal (P)	070	032	-131	172	068	-064	177
09	Total Lymphocyte Count Ratio - Post Stress/Basal (P)	212	-078	-057	318	164	-088	246
10	Total Lymphocyte Count Ratio - Pre Stress/Basal (T)	-020	-032	-022	-071	-125	-170	141
11	Total Lymphocyte Count Ratio - Stress/Basal (T)	-012	-166	196	204	076	006	358
12	Total Lymphocyte Count Ratio - Post Stress/Basal (T)	-018	-134	033	192	063	-035	196
13	17-Ketosteroid Output Ratio - Pre Stress/Basal (P)	-028	-092	-259	118	434	021	-208
14	17-Ketosteroid Output Ratio - Stress/Basal (P)	234	-065	-061	380	530	048	-186
15	17-Ketosteroid Output Ratio - Post Stress/Basal (P)	022	030	-274	282	636	190	-314
16	17-Ketosteroid Output Ratio - Pre Stress/Basal (T)	882	172	103	-036	-067	020	242
17	17-Ketosteroid Output Ratio - Stress/Basal (T)	832	133	102	247	244	-020	049
18	17-Ketosteroid Output Ratio - Post Stress/Basal (T)	826	002	151	084	-110	-066	196
19	Creatinine Sample - Basal (P)	002	193	102	-032	326	-168	-023
20	Creatinine Sample - Pre Stress (P)	060	022	423	-128	-242	-115	236
21	Creatinine Sample - Stress (P)	-051	205	327	-212	-008	-068	212
22	Creatinine Sample - Post Stress (P)	-064	-005	457	020	-087	-140	192
23	Creatinine Sample - Basal (T)	184	092	460	-102	-061	-216	406
24	Creatinine Sample - Pre Stress (T)	106	202	101	-146	-066	-174	251
25	Creatinine Sample - Stress (T)	006	029	214	-080	098	-152	132
26	Creatinine Sample - Post Stress (T)	162	-098	368	-048	-131	-090	234
27	17-Ketosteroid Output	-149	-051	383	-068	-439	-028	232
28	Androgen Output	-202	-174	180	104	-220	-023	207
29	Lie Value (MMPI)‡	-124	-085	-056	096	002	102	-183
30	F (Validity) Value (MMPI)	076	050	-108	124	-053	213	108
31	Hs (Hypochondriasis) Value (MMPI)	151	-145	-206	-082	-122	164	-358
32	D (Depression) Value (MMPI)	-066	180	-203	028	122	266	-137
33	Hy (Hysteria) Value (MMPI)	-026	-113	012	243	214	049	-226
34	Pd (Psychopathic Deviate) Value (MMPI)	-032	-063	031	224	282	120	-190
35	Mf (Interest) Value (MMPI)	262	103	-020	166	-118	134	-095
36	Pa (Paranoia) Value (MMPI)	-158	-123	-123	180	066	050	-319
37	Pt (Psychasthenia) Value (MMPI)	216	-068	-221	-013	-158	116	-172
38	Sc (Schizophrenia) Value (MMPI)	432	042	-172	-052	-190	204	-020
39	Ma (Hypomania) Value (MMPI)	290	050	-092	096	-049	-074	299
40	General Classification Test Value (Navy Basic Battery)	286	052	156	112	-078	218	272
41	Arithmetic Reasoning Value (Navy Basic Battery)	336	000	192	104	-062	168	176
42	Mechanical Aptitude Value (Navy Basic Battery)	078	-024	047	044	-182	-058	308
43	Mechanical Knowledge Value (Navy Basic Battery)	174	173	078	-042	-167	-102	456
44	Electrical Knowledge Value (Navy Basic Battery)	176	072	-001	168	-164	-039	310
45	Personal History (Navy Enlisted Personal Inventory)	492	078	-234	060	-138	066	-048
46	Medical History (Navy Enlisted Personal Inventory)	216	-079	-066	-052	-224	-006	-126
47	Two Hand Coordination Test	106	030	066	041	000	086	144
48	Tank Grade	-008	072	016	004	102	074	-181
49	Total Testicular Volume	078	000	111	-068	-044	104	196
50	Muscular Tonus	-038	092	360	114	110	087	232
51	General Bodily Cleanliness	-034	100	-030	-227	-018	-246	058
52	Acne	122	060	078	137	200	-270	052
53	Perspiration - Hands	-070	080	-154	-068	-033	184	-084
54	Perspiration - Axillary	062	-013	-081	110	126	-049	006
55	Prominence of Larynx	-114	126	-282	-028	090	-066	197
56	Penis (Superior-Inferior Dimension)	-085	133	-066	-090	208	-193	344
57	Penis (Lateral Dimension)	-109	-013	068	-346	022	090	358
58	Varicocoele	072	141	-117	-086	088	083	-006
59	Cremasteric Reflex	-106	090	-044	-263	-300	-039	-043
60	Rhomberg	026	-052	124	040	000	-336	000
61	Deep Reflexes	-153	203	-202	-184	-168	412	-066
62	Tremors	104	170	-153	032	192	134	-052
63	General Body Hair Distribution	-042	-013	384	-056	-308	380	087
64	Pubic Hair Distribution	-036	-098	042	125	-080	330	223
65	Beard	-106	-006	236	-016	-132	387	047
66	Cerumen	075	-026	216	120	064	186	-062
67	Lymph Tissue Present	086	-124	-014	186	-137	-073	-201
68	Potential Lymph Tissue	023	-014	-049	081	-155	004	-326
69	Chest Circumference	-060	060	792	-016	042	-108	208
70	Calf Circumference	010	-052	641	-090	-038	-052	097
71	Face Breadth	-051	032	517	-098	-121	-024	134
72	Hand Length	-261	086	134	-226	-006	-060	338
73	Hand Breadth	-112	022	440	-234	-112	-028	368
74	Disproportions	-133	007	-858	-031	-040	132	-034
75	Hand Area	-216	060	331	-260	-066	-047	402
76	Somatotype A - Endomorphy	-002	-068	392	001	-090	-188	-282
77	Somatotype B - Mesomorphy	081	-042	732	017	-175	203	246
78	Somatotype C - Ectomorphy	-006	088	-784	022	284	-019	-068

77	Somatotype B - Mesomorphy	081	-042	732	017	-175	203	246
78	Somatotype C - Ectomorphy	-006	088	-784	022	284	-019	-068
79	Dysplasia	064	091	052	-113	-214	303	-084
80	Masculine Component	042	185	-154	-028	208	345	312
81	Weight	-019	096	667	-132	-062	-097	252
82	Stature	-078	132	002	-173	036	-043	340
83	Chest Depth	-051	160	603	-034	038	060	182
84	Bi-iliac	-102	086	126	-287	-056	-019	174
85	Head Circumference	028	076	426	-064	124	008	120
86	Resting Pulse (Navy Step Test)	238	000	106	112	-064	-028	216
87	Endurance Time (Harvard Step Test)	072	-006	-032	-058	-086	-123	-034
88	Pulse Increase After Endurance Test (Harvard Step Test)	-085	078	-136	-032	052	305	-064
89	Pulse for 3.0-3.5 Minute Interval (Harvard Step Test)	143	112	117	-108	-237	411	-002
90	Standing Pulse Rate (Schneider Index)	-060	-090	-037	-048	-261	-051	106
91	Standing Systolic Blood Pressure (Schneider Index)	152	148	-030	-068	-058	200	-002
92	Reclining Systolic Blood Pressure (Schneider Index)	101	-008	128	020	-184	037	-194
93	Reclining Diastolic Blood Pressure (Schneider Index)	152	-034	003	-108	-045	245	-122
94	Standing Pulse Pressure (Schneider Index)	-016	114	-070	048	055	213	-026
95	Hand Dynamometer (Reading No. 1 - Right Hand)	-048	118	418	-021	061	-214	310
96	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (P)	004	192	278	-120	110	084	118
97	Polymorphonuclear Leucocyte Ratio - Stress/Basal (P)	-093	204	048	-114	060	-059	002
98	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (P)	-109	116	-056	-094	182	056	-022
99	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (T)	033	-023	178	-070	010	-074	248
100	Polymorphonuclear Leucocyte Ratio - Stress/Basal (T)	-090	-117	155	-116	-127	042	171
101	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (T)	-018	-116	012	042	-110	-150	062
102	Eosinophil Ratio - Pre Stress/Basal (P)	000	037	-024	-102	054	-141	042
103	Eosinophil Ratio - Stress/Basal (P)	049	-102	-042	217	048	-018	-034
104	Eosinophil Ratio - Post Stress/Basal (P)	-041	-073	038	226	-009	-212	150
105	Eosinophil Ratio - Pre Stress/Basal (T)	014	-408	-101	205	-023	-178	091
106	Eosinophil Ratio - Stress/Basal (T)	-123	-436	-012	301	154	-082	042
107	Eosinophil Ratio - Post Stress/Basal (T)	-019	-312	-079	228	229	044	-016
108	Basophil Ratio - Pre Stress/Basal (P)	-068	-106	-182	235	040	-204	-014
109	Basophil Ratio - Stress/Basal (P)	215	-020	-057	-024	-082	008	112
110	Basophil Ratio - Post Stress/Basal (P)	134	100	-063	144	069	-110	152
111	Basophil Ratio - Pre Stress/Basal (T)	-016	-406	048	269	-013	235	132
112	Basophil Ratio - Stress/Basal (T)	-040	-316	046	090	017	096	150
113	Basophil Ratio - Post Stress/Basal (T)	-023	-114	000	066	034	338	199
114	Monocyte Ratio - Pre Stress/Basal (P)	-058	-014	170	-148	-308	-342	-176
115	Monocyte Ratio - Stress/Basal (P)	-002	-200	210	052	-242	252	143
116	Monocyte Ratio - Post Stress/Basal (P)	-028	080	112	-043	-190	-304	-199
117	Monocyte Ratio - Pre Stress/Basal (T)	006	-588	-038	372	-043	290	-013
118	Monocyte Ratio - Stress/Basal (T)	030	-161	137	162	-154	133	-032
119	Monocyte R[illegible] - Post Stress/Basal (T)	-012	-500	024	206	-042	236	105
120	Total Resp[illegible] (Rorschach - K)	122	216	068	-596	-332	-012	108
121	Total Check[illegible]orschach - K)	-203	-812	-122	126	017	-278	-428
122	Total Stres[illegible]ore (Rorschach - K)	-202	-817	-146	024	-187	-301	-245
123	Location (R[illegible]rschach - K)	056	-262	172	-260	-375	-274	-056
124	Content (Rorschach - K)	-018	-352	-125	026	-012	-128	-304
125	Form (Rorschach - K)	-057	-500	-156	-151	-266	-089	-354
126	Shading (Rorschach - K)	058	607	-028	416	-174	-208	-413
127	Movement (Rorschach - K)	-202	-151	-086	048	236	-222	-483
128	Color (Rorschach - K)	-169	-737	-116	226	144	-068	020
129	FM + m [C1 Stress] (Rorschach - K)	-042	055	-114	-031	-095	-140	048
130	k + K[D] (Rorschach - K)	-010	-149	-096	-189	-167	004	-230
131	Fc + c[E] (Rorschach - K)	064	-504	008	341	-024	-164	-462
132	Fc + c[E_1 Stress] (Rorschach - K)	132	-155	138	305	-275	-092	-123
133	CF + C[I] (Rorschach - K)	-064	-637	-030	283	-048	-044	024
134	Refusal (Rorschach - K)	-130	-254	-134	142	024	-083	-082
135	Appearance and Manner (E)	044	-018	532	-040	-173	077	125
136	Appearance and Manner (K)	074	035	508	199	000	094	044
137	Family History (E)	235	018	121	006	-171	130	-118
138	Family History (K)	004	112	199	010	-140	301	-234
139	Psychological and Social Maturity (E)	114	076	326	-023	-122	-068	364
140	Psychological and Social Maturity (K)	110	017	251	038	-073	020	118
141	Leadership (E)	136	-003	383	287	166	034	064
142	Leadership (K)	100	168	296	091	081	131	-085
143	Participation in Athletics (E)	-072	-200	352	300	-040	-186	052
144	Participation in Athletics (K)	001	-007	401	184	083	100	-158
145	Attitude toward Rough Sports (E)	-132	-162	425	194	-024	-352	-054
146	Attitude toward Rough Sports (K)	-132	-100	358	132	038	070	-110
147	Total Responses (Rorschach - S)	082	150	050	-590	-342	-004	082
148	M% (Rorschach - S)	139	222	-006	373	096	114	340
149	FM% (Rorschach - S)	023	164	104	307	312	258	-074
150	m% (Rorschach - S)	-086	088	081	048	-002	-010	339
151	k% (Rorschach - S)	-036	-059	-104	-063	-080	-065	-052
152	K% (Rorschach - S)	118	-122	-081	-008	-289	176	-171
153	FK% (Rorschach - S)	188	-136	105	038	039	159	010
154	F% (Rorschach - S)	-259	-136	-274	-703	-128	-058	-128
155	Fc% (Rorschach - S)	046	082	145	064	090	-126	108
156	c% (Rorschach - S)	034	-190	066	372	-312	-317	-053
157	C'% (Rorschach - S)	032	080	189	208	020	-278	111
158	FC (Rorschach - S)	192	420	028	-013	186	120	-182
159	CF (Rorschach - S)	174	-370	223	438	-287	-162	-007
160	C (Rorschach - S)	-077	-384	-116	147	028	106	-072
161	W% (Rorschach - S)	144	-263	032	995	092	-251	026

2

83	Chest Depth	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
84	Bi-iliac	-102	086	126	-287	-056	-019	174
85	Head Circumference	028	076	426	-064	124	008	120
86	Resting Pulse (Navy Step Test)	238	000	106	112	-064	-028	216
87	Endurance Time (Harvard Step Test)	072	-006	-032	-058	-086	-123	-034
88	Pulse Increase After Endurance Test (Harvard Step Test)	-085	078	-136	-032	052	305	-064
89	Pulse for 3.0-3.5 Minute Interval (Harvard Step Test)	143	112	117	-108	-237	411	-002
90	Standing Pulse Rate (Schneider Index)	-060	-090	-037	-048	-261	-051	106
91	Standing Systolic Blood Pressure (Schneider Index)	152	148	-030	-068	-058	200	-002
92	Reclining Systolic Blood Pressure (Schneider Index)	101	-008	128	020	-184	037	-194
93	Reclining Diastolic Blood Pressure (Schneider Index)	152	-034	003	-108	-045	245	-122
94	Standing Pulse Pressure (Schneider Index)	-016	114	-070	048	055	213	-026
95	Hand Dynamometer (Reading No. 1 - Right Hand)	-048	118	418	-021	061	-214	310
96	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (P)	004	192	278	-120	110	084	118
97	Polymorphonuclear Leucocyte Ratio - Stress/Basal (P)	-093	204	048	-114	060	-059	002
98	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (P)	-109	116	-056	-094	182	056	-022
99	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (T)	033	-023	178	-070	010	-074	248
100	Polymorphonuclear Leucocyte Ratio - Stress/Basal (T)	-090	-117	155	-116	-127	042	171
101	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (T)	-018	-116	012	042	-110	-150	062
102	Eosinophil Ratio - Pre Stress/Basal (P)	000	037	-024	-102	054	-141	042
103	Eosinophil Ratio - Stress/Basal (P)	049	-102	-042	217	048	-018	-034
104	Eosinophil Ratio - Post Stress/Basal (P)	-041	-073	038	226	-009	-212	150
105	Eosinophil Ratio - Pre Stress/Basal (T)	014	-408	-101	205	-023	178	091
106	Eosinophil Ratio - Stress/Basal (T)	-123	-436	-012	301	154	-082	042
107	Eosinophil Ratio - Post Stress/Basal (T)	-019	-312	-079	228	229	044	-016
108	Basophil Ratio - Pre Stress/Basal (P)	-068	-106	-182	235	040	-204	-014
109	Basophil Ratio - Stress/Basal (P)	215	-020	-057	-024	-082	008	112
110	Basophil Ratio - Post Stress/Basal (P)	134	100	-063	144	069	-110	152
111	Basophil Ratio - Pre Stress/Basal (T)	-016	-406	048	269	-013	235	132
112	Basophil Ratio - Stress/Basal (T)	-040	-316	046	090	017	096	150
113	Basophil Ratio - Post Stress/Basal (T)	-023	-114	000	066	034	338	199
114	Monocyte Ratio - Pre Stress/Basal (P)	-058	-014	170	-148	-308	-342	-176
115	Monocyte Ratio - Stress/Basal (P)	-002	-200	210	052	-242	252	143
116	Monocyte Ratio - Post Stress/Basal (P)	-028	080	112	-043	-190	-304	-199
117	Monocyte Ratio - Pre Stress/Basal (T)	006	-588	-038	372	-043	290	-013
118	Monocyte Ratio - Stress/Basal (T)	030	-161	137	162	-154	133	-032
119	Monocyte Ratio - Post Stress/Basal (T)	-012	-500	024	206	-042	236	105
120	Total Responses (Rorschach - K)	122	216	068	-596	-332	-012	108
121	Total Checks (Rorschach - K)	-203	-812	-122	126	017	-278	-428
122	Total Stress Score (Rorschach - K)	-202	-817	-146	024	-187	-301	-245
123	Location (Rorschach - K)	056	-262	172	-260	-375	-274	-056
124	Content (Rorschach - K)	-018	-352	-125	026	-012	-128	-304
125	Form (Rorschach - K)	-057	-500	-156	-151	-266	-089	-354
126	Shading (Rorschach - K)	058	-607	-028	416	-174	-208	-413
127	Movement (Rorschach - K)	-202	-151	-086	048	236	-222	-483
128	Color (Rorschach - K)	-169	-737	-116	226	144	-068	020
129	FM + m [Cl Stress] (Rorschach - K)	-042	055	-114	-031	-095	-140	048
130	k + K[D] (Rorschach - K)	-010	-149	-096	-189	-167	004	-230
131	Fc + c[E] (Rorschach - K)	064	-504	008	341	-024	-164	-462
132	Fc + c[E_1 Stress] (Rorschach - K)	132	-155	138	305	-275	-092	-123
133	CF + C[I] (Rorschach - K)	-064	-637	-030	283	-048	-044	024
134	Refusal (Rorschach - K)	-130	-254	-134	142	024	-083	-082
135	Appearance and Manner (E)	044	-018	532	-040	-173	077	125
136	Appearance and Manner (K)	074	035	508	199	000	094	044
137	Family History (E)	235	018	121	006	-171	130	-118
138	Family History (K)	004	112	199	010	-140	301	-234
139	Psychological and Social Maturity (E)	114	076	326	-023	-122	-068	364
140	Psychological and Social Maturity (K)	110	017	251	038	-073	020	118
141	Leadership (E)	136	-003	383	287	166	034	064
142	Leadership (K)	100	168	296	091	081	131	-085
143	Participation in Athletics (E)	-072	-200	352	300	-040	-186	052
144	Participation in Athletics (K)	001	-007	401	184	083	100	-158
145	Attitude toward Rough Sports (E)	-132	-162	425	194	-024	-352	-054
146	Attitude toward Rough Sports (K)	-132	-100	358	132	038	070	-110
147	Total Responses (Rorschach - S)	082	150	050	-590	-342	-004	082
148	M% (Rorschach - S)	139	222	-006	373	096	114	340
149	FM% (Rorschach - S)	023	164	104	307	312	258	-074
150	m% (Rorschach - S)	-086	088	081	048	-002	-010	339
151	k% (Rorschach - S)	-036	-059	-104	-063	-080	-065	-052
152	K% (Rorschach - S)	118	-122	-081	-008	-289	176	-171
153	FK% (Rorschach - S)	188	-136	105	038	039	159	010
154	F% (Rorschach - S)	-259	-136	-274	-703	-128	-058	-128
155	Fc% (Rorschach - S)	046	082	145	064	090	-126	108
156	c% (Rorschach - S)	034	-190	066	372	-312	-317	-053
157	C'% (Rorschach - S)	032	080	189	208	020	-278	111
158	FC (Rorschach - S)	192	420	028	-013	186	120	-182
159	CF (Rorschach - S)	174	-370	223	438	-287	-162	-007
160	C (Rorschach - S)	-077	-384	-116	147	028	106	-072
161	W% (Rorschach - S)	144	-263	032	995	092	-251	026
162	D% (Rorschach - S)	-119	342	-067	-800	031	290	-055
163	d% (Rorschach - S)	-124	-105	214	-484	-163	136	090
164	rd% (Rorschach - S)	-036	108	-124	-529	-131	036	-030

* P = Psychological Stress.

** T = Tank Stress.

‡ MMPI = Minnesota Multiphasic Personality Inventory.

Rorschach Factors. Factor 2 had highly significant negative loadings on several of the Rorschach measures taken from the records of scorer K. These included such items as total stress score (variable 122), total checks (variable 121), color (variable 128), CF + C (variable 133), and shading (variable 126). Moderately significant negative loadings were found for Fc + c (E) (variable 131), form (variable 125), C (variable 160), CF (variable 159), and content (variable 124). Positive loadings of moderate significance were found for FC (variable 158) and D% (variable 162). Negative loadings of moderate significance were found for variable 117, 119, 106, 105, and 111 representing certain of the blood cell ratios for the tank stress situation. Additional negative and positive loadings of borderline to slight significance were present for other Rorschach, blood cell ratios, etc. The Rorschach pattern in evidence on this factor is suggestive of the controlled individual whose emotional responsiveness tends to be subordinated to the mores; he channels his wishes into "proper" forms of expression, and he is eager to be in emotional consonance with society because he is concerned with the attitudes others will adopt toward him. Mons suggests that "the FC person feels emotionally stimulated to activity but co-ordinates this impulse through the control of reason and directs it into suitable and profitable channels" (59). Thus the individual is reactive or alert to his social environment in order to insure conformance. The factor is designated as a tendency toward reactivity or alertness.

Factor 4 had highly to moderately significant positive loadings on W% (variable 161), CF (variable 159), and shading (variable 126) with equally significant negative loadings on D% (variable 162), F% (variable 154), total responses (K) (variable 120), total responses (S) (variable 147), rd% (variable 164) and d% (variable 163). Additional loadings of lesser significance were found for 35 other measures representing the Rorschach tests, personal interview, blood count ratios, physical examination results, and anthropometry.

The Rorschach pattern (as evidenced by the positive loadings on W% and FC and negative loadings of the same magnitude on D% and F) suggests the individual who tends to give answers in terms of the total picture rather than in terms of details and acts on impulse rather than the dictates of common sense - the man who acts with his heart rather than his head. The term globalization and/or generalization is suggested for this factor.

Factor 6 is poorly defined; the only two positive loadings of moderate significance were for deep reflexes (variable 61), and pulse for 3-3.5 minute interval (variable 89). Slightly significant positive

loadings were found for beard (variable 65), general body hair distribution (variable 63), masculine component (variable 80), and pubic hair distribution (variable 64), suggesting that this factor may in some vague manner represent a hormonal responsiveness. Many additional loadings of both signs but of borderline to slight significance were included in this factor but no definite pattern was evident.

Factor 7 had moderately high negative loadings on several Rorschach measures, e.g., movement (-.483), k + K (-.462), total checks (-.428), and shading (-.413). The Rorschach pattern is suggestive of concrete-minded individuals who are realistically oriented toward their environment. This concept is supported by the negative loadings on the MMPI scales for hypochondriasis (-.358), paranoia (-.319), and hysteria (-.226), indicating that individuals high on this factor tend to lack self-consciousness and self-pity and have a direct acceptance of their environment. Accordingly, the factor is designated orientation in environment. This factor also had significant positive loadings on mechanical knowledge (.456), electrical knowledge (.310), and mechanical aptitude (.308). The positive loading on the MMPI hypomania scale (.308) is logical in that over-active individuals often find release in mechanical pursuits. There were also significant positive loadings on masculine component and many related variables - body type (.246 for mesomorphs compared to -.282 for endomorphs), hand length, breadth, and area, weight, stature, chest circumference, muscular tonus, pubic hair distribution, penis dimensions, and androgen, indicative of both physiological and hormonal evidence of masculinity. The significant positive loading on interviewer E's estimate for psychological and social maturity reflects the influence of "masculinity" which, as shown in Appendix D, influenced his overall impression of a man.

DISCUSSION

The results suggest that a relatively small number of factors from the areas covered would be adequate to characterize an individual physiologically and psychologically. This conclusion must be tempered, however, by the narrow variability in much of the data. Having undergone extensive preliminary screening prior to reporting for Submarine School, the group was obviously much more homogeneous than a similar age group drawn at random from the general population.

That the seven factors extracted in the final analysis are not more clear-cut is attributed in part to the high variable to subject

ratio (i. e., many more variables than subjects) and in part to the fact that the two stress situations were common to so many of the measurements.

Determination of the usefulness of any extracted fact or to predict performance or classify individuals for a particular task must await a replication of the study to assess the stability of the seven factors. It is suggested that such a replication involve a small number of variables with meaningful and interpretable high loadings on each of these final factors and, of course, a new group of subjects. The data presented in this report should be of value in planning the experimental procedure.

Although less than originally envisioned, the accomplishments of this study are still substantial. The basic report (56) has been employed as a training device in teaching applications of factor analysis at the University of Connecticut, and it has been indicated as highly relevant to a compilation project currently underway at the University of Alberta.

There is, of course, much of value in the area studies. The 17-ketosteroid and lymphocyte responses provide corroborative support for studies on other service groups, and the amount of 17-ketosteroid increase during stress is considered a reliable measure of individual differences.

The factorial appraisal of the physical fitness data indicated that the three tests studied varied in the functions which they measure and also in the importance assigned these functions in final test scores. Delineation of the physiological trait of physical fitness is, of course, the province of specialists in this field. However, this study offers a lead for a re-evaluation and systematization of fitness estimates.

The quite different reactions evidenced by the two men who separately interviewed each subject should be thought-provoking to workers in personnel psychology. The evidence of a relationship between performance on intelligence and aptitude tests with personality traits as measured by the MMPI is considered worthy of note inasmuch as the minor personality accentuations found were within generally acceptable normal ranges.

Factorial studies of Rorschach data are extremely rare, and on that basis alone, the material presented in Appendix E is worthwhile. Also quite unique is the independent scoring of Rorschach responses by

two individuals trained in different methods of interpretation. Dr. Anna Roe, famous for her interpretation of the Rorschach pattern of various groups of scientists (engineers, biologists, etc.) requested our data for her studies on various categories of service personnel. More recently Dr. H. M. Corter, Director of the Psychology Clinic, North Carolina State College, has indicated an interest in performing additional statistical appraisal of the data. The author is not qualified to interpret the underlying basis for the correlations observed between various blood ratios and Rorschach scores, and the literature is silent on this point. The data offer an interesting challenge to workers in these highly specialized areas.

The anthropometric measurements have furnished the Naval Electronics Laboratory with quantitative information to assist in the design of equipment. It is also worth mentioning that the relationships of body type, physiological response to exercise, and interest patterns brought out in the well-known Grant study on Harvard University students (60) were also observed in this study despite the fact that our population was much more homogeneous.

It is hoped that the publication of data from the area studies in sufficient detail to permit additional investigations of particular interest to certain specialists will stimulate such individuals to explore the data further.

SUMMARY AND CONCLUSIONS

This study examined a wide variety of measures employed in selection with the ultimate aim of reducing to a minimum the dangers as well as the cost of training men later determined to be unsuitable for submarine service. The variables were also considered applicable to other service groups and, possibly, to industry as well. The population consisted of 120 randomly selected submarine enlisted candidates. Each group of six men underwent a 3-day experimental program under carefully controlled living conditions; two such groups were tested each week.

Measures considered for the particular purposes of this study included estimates of the reactions of 17-ketosteroids and blood lymphocytes during two stressful situations (undergoing routine training procedures in the submarine escape training tank at New London, Conn. and taking difficult written examinations), three physical fitness and a hand dynamometer test, the group form of the Rorschach ink-blot test,

the Minnesota Multiphasic Personality test, two-hand coordination, an evaluation of performance in the escape tank, a replication of the famous Grant study on anthropometry and somatotyping, and several estimates of masculinity.

Data from some measures routinely used in screening submarine candidates were also included in more standardized form. For instance, two interviewers talked with each subject separately and rated him on a more definitely delineated form than usually employed. Results of the routine physical examination were recorded both by the usual verbal descriptions and by rating the various items on a special form. GCT scores were obtained from the subjects' records and included in the data.

In all, 362 measures were obtained. These were broken into the following sub-studies in order to render the quantity of data manageable: 17-ketosteroid, blood counts and ratios, physical fitness, psychological tests, personal interview, Rorschach, physical examining, and anthropometry.

From each area, several factors were extracted that appeared to hold promise for classifying individuals, and accordingly these were combined to explore inter-area relationships. The seven factors extracted in the final rotations accounted for 90 per cent of the total variance. Two of these factors related to the change in the 17-ketosteroid ratios during the psychological stress situation and the tank stress situation. Another factor had significant loadings on a variety of measures which are directly related to body build or size-strength configuration; negative loadings on some of the personality scores reinforced the masculinity pattern. This factor was designated size-strength with masculinity overtones. The cluster of loadings on one extracted factor was suggestive of the controlled individual whose emotional impulses are diverted into suitable channels -- the type of person who "thinks" with his head rather than his heart. In contrast to this was a factor with a cluster of loadings suggestive of generalization (the whole picture without concern for details) and emotionality, the type of person who "thinks" with his heart rather than his head. The loadings on another factor were considered as indicating orientation in environment; this factor also had masculinity overtones.

A poorly defined factor was considered vaguely suggestive of hormonal response and was so designated.

While the results suggest that a relatively small number of factors from the areas studied would be adequate to characterize an individual physiologically and psychologically, this conclusion is tempered somewhat by the narrow variability in much of the data. Determination of the usefulness of any extracted factor to predict performance or classify individuals for a particular task requires assessing the stability of the seven factors on another population. Inasmuch as the high variable-to-subject ratio is considered in large part responsible for the fact that the extracted factors were not more clear-cut, it is recommended that such a replication involve a small number of variables with meaningful and interpretable high loadings on each of the final factors.

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APPENDIX A

17-Ketosteroid, Androgen and Creatinine Studies

Table A-1

Individual 17-Ketosteroid Values (expressed in milligrams per hour)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	0.38	0.39	0.40	0.62	0.12	0.24	0.98	0.42
01	2*	0.52	0.82	0.91	0.79	0.51	1.00	1.07	0.76
01	3*	0.17	0.38	0.22	0.29	0.15	-	-	-
01	4*	0.33	0.07	0.54	0.23	0.12	0.55	0.42	0.14
01	5*	0.41	0.63	0.42	0.26	0.25	0.17	0.34	0.28
01	6*	0.51	0.63	0.37	0.55	0.11	0.55	0.27	0.71
02	1	0.29	0.39	0.51	0.18	0.23	0.09	0.19	0.17
02	2	0.45	0.52	0.68	0.33	0.30	0.16	0.27	0.65
02	3	0.24	0.59	0.45	0.22	0.20	0.50	0.36	0.80
02	4	0.24	0.40	0.48	0.56	0.35	(0.12)	0.13	0.27
02	5*	0.20	0.11	0.42	0.43	0.12	0.29	0.51	0.19
02	6	0.13	0.26	0.18	0.13	0.08	0.32	0.09	0.31
03	1	0.13	0.64	0.34	0.25	0.21	0.24	0.34	0.65
03	2	0.06	0.47	0.21	0.57	0.20	0.44	0.27	0.25
03	3	0.31	0.52	0.37	0.27	0.47	0.32	0.35	0.33
03	4	0.16	0.61	0.23	0.34	0.15	0.64	0.31	0.26
03	5	0.31	0.65	0.22	0.27	0.27	0.78	0.48	0.25
03	6	0.33	0.18	0.17	0.36	0.15	0.89	0.19	0.34
04	1	0.25	0.32	0.16	0.39	0.21	0.24	0.60	0.48
04	2	0.35	0.32	0.49	0.68	0.34	0.47	0.20	0.58
04	3	0.50	1.20	0.63	0.53	0.46	(0.70)	(1.32)	0.42
04	4*	0.19	0.34	0.33	0.27	0.14	0.34	-	0.42
04	5	0.37	0.74	0.76	0.60	0.22	0.78	0.45	0.61
04	6	0.37	0.57	0.55	0.25	0.10	0.22	0.13	0.17
05	1	0.19	0.10	0.20	0.92	0.15	0.50	0.34	0.51
05	2*	0.17	0.65	0.40	0.17	0.19	0.36	(0.66)	(1.17)
05	3*	-	-	-	-	-	-	-	-
05	4	0.29	0.16	0.07	0.44	0.23	0.77	0.35	0.54
05	5	0.34	0.42	1.02	0.60	0.18	0.41	0.26	0.62
05	6	0.67	0.31	0.53	0.62	0.21	0.74	0.38	0.38
06	1	0.15	0.41	0.48	0.37	0.28	0.50	0.53	0.60
06	2	0.43	0.55	0.72	0.69	0.35	0.69	0.72	0.58
06	3	0.32	0.31	0.19	0.34	0.31	0.57	0.53	0.75
06	4	0.18	0.15	0.55	0.13	0.18	0.65	0.52	0.23
06	5	0.19	0.44	0.32	0.64	0.38	0.63	0.50	0.50
06	6	0.15	0.18	0.28	0.12	0.10	0.08	0.23	0.34
07	1*	0.46	0.49	0.28	0.43	0.24	0.62	0.58	0.43
07	2*	0.34	0.77	-	0.16	0.25	0.43	0.59	0.62
07	3	0.61	0.98	0.90	0.64	0.09	1.08	0.86	1.84
07	4*	0.22	0.52	0.23	0.46	0.45	0.52	0.53	-
07	5	0.35	0.59	0.50	0.57	0.27	0.92	0.54	0.38
07	6	0.22	0.57	0.28	0.41	0.32	0.54	0.30	0.75
08	1	0.27	0.77	0.55	0.44	0.20	0.48	0.22	0.40
08	2	0.16	0.21	0.37	0.19	0.30	0.10	0.30	0.13
08	3	0.21	0.68	0.71	0.32	0.31	0.41	0.62	0.68
08	4	0.30	0.59	0.38	0.40	0.36	0.37	0.62	0.50
08	5*	0.17	0.69	0.30	0.22	0.37	0.42	0.32	0.57
08	6*	0.20	0.62	-	0.34	0.20	0.70	0.35	0.39
09	1*	0.30	0.51	0.33	0.60	0.35	0.17	0.65	0.46
09	2	0.25	0.34	0.40	0.49	0.26	0.43	0.47	0.52
09	3*	0.40	0.36	-	0.43	(0.36)	0.46	0.26	0.64
09	4*	-	0.87	0.64	0.43	0.52	0.76	0.38	0.52
09	5	0.16	0.33	0.30	0.09	0.20	0.33	0.34	0.38
09	6*	0.50	0.36	0.52	0.25	0.25	0.39	0.25	0.31

	1*	0.46	0.49	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	2*	0.34	0.77	-	0.16	0.25	0.43	0.59	0.62
	3	0.61	0.98	0.90	0.64	0.09	1.08	0.86	1.84
	4*	0.22	0.52	0.23	0.46	0.45	0.52	0.53	-
	5	0.35	0.59	0.50	0.57	0.27	0.92	0.54	0.38
	6	0.22	0.57	0.28	0.41	0.32	0.54	0.30	0.75
	1	0.27	0.77	0.55	0.44	0.20	0.48	0.22	0.40
	2	0.16	0.21	0.37	0.19	0.30	0.10	0.30	0.13
	3	0.21	0.68	0.71	0.32	0.31	0.41	0.62	0.68
08	4	0.30	0.59	0.38	0.40	0.36	0.37	0.62	0.50
08	5*	0.17	0.69	0.30	0.22	0.37	0.42	0.32	0.57
08	6*	0.20	0.62	-	0.34	0.20	0.70	0.35	0.39
09	1*	0.30	0.51	0.33	0.60	0.35	0.17	0.65	0.46
09	2	0.25	0.34	0.40	0.49	0.26	0.43	0.47	0.52
09	3*	0.40	0.36	-	0.43	(0.36)	0.46	0.26	0.64
09	4*	-	0.87	0.64	0.43	0.52	0.76	0.38	0.52
09	5	0.16	0.33	0.30	0.09	0.20	0.33	0.34	0.38
09	6*	0.50	0.36	0.52	0.25	0.25	0.39	0.25	0.31
10	1	0.26	0.16	0.30	0.22	0.52	0.82	0.63	0.72
10	2	0.07	0.13	0.09	0.18	0.33	0.33	0.16	0.49
10	3	0.11	0.13	0.20	0.08	0.18	0.18	0.31	0.19
10	4	0.15	0.30	0.14	0.10	0.16	0.61	0.44	0.18
10	5	0.60	0.58	0.38	0.64	0.15	0.62	0.15	0.48
10	6	0.11	0.10	0.60	0.10	0.44	0.14	0.63	0.17
11	1	0.41	0.31	0.16	0.50	0.43	0.79	0.44	0.06
11	2	0.42	0.24	0.23	0.13	0.33	0.32	0.32	0.42
11	3	0.22	0.77	0.39	0.24	0.35	0.58	0.19	0.14
11	4*	0.28	-	-	-	0.11	-	-	-
11	5	0.31	0.38	0.19	0.18	0.35	0.45	0.10	1.25
11	6	0.39	0.46	0.11	0.16	0.05	0.88	0.33	0.34
12	1	0.33	0.24	0.11	0.56	0.28	0.33	0.22	0.40
12	2*	0.16	0.18	-	0.43	0.27	0.50	0.21	0.34
12	3	0.18	0.45	0.34	0.19	0.22	0.16	0.35	0.20
12	4	0.06	0.12	0.08	0.08	0.04	0.09	0.07	0.05
12	5	0.20	0.06	0.10	0.07	0.22	0.16	0.35	0.20
12	6	0.15	0.12	0.22	0.09	0.11	0.06	0.06	0.12
13	1	0.13	0.47	0.14	0.35	0.13	0.32	0.26	0.22
13	2	0.29	0.65	0.30	0.52	0.31	0.38	0.33	0.35
13	3	0.21	0.14	0.37	0.34	0.35	0.25	0.29	0.36
13	4	0.22	0.31	0.30	0.27	0.33	0.21	0.28	0.61
13	5	0.19	0.43	0.39	0.51	0.26	0.58	0.50	0.38
13	6	0.37	0.27	0.43	0.38	0.14	0.48	0.33	0.14
14	1	0.02	0.43	0.15	0.10	0.03	0.35	0.53	0.11
14	2	0.06	0.33	0.10	0.30	0.09	0.15	0.34	0.13
14	3*	-	-	-	-	-	-	-	-
14	4	0.23	0.42	0.53	0.53	0.18	0.65	0.19	0.38
14	5*	0.07	-	-	-	0.11	0.28	0.32	0.19
14	6*	0.34	0.06	0.59	0.40	0.41	1.09	0.75	0.64
15	1*	0.44	0.61	0.53	0.69	0.09	1.04	0.73	0.64
15	2	0.18	0.32	0.40	0.11	0.05	0.43	0.21	0.23
15	3	0.21	0.11	0.36	0.56	0.20	0.70	0.12	0.36
15	4	0.19	0.31	0.31	0.29	0.09	0.06	0.20	0.29
15	5	0.13	0.35	0.23	0.07	0.06	0.34	0.06	0.12
15	6	0.12	0.07	0.09	0.14	0.31	0.34	0.10	0.19
16	1	0.15	0.21	0.12	0.20	0.13	0.18	0.14	0.25
16	2	0.14	0.18	0.19	0.25	0.24	0.17	0.11	0.06
16	3*	0.18	0.44	0.22	0.34	0.09	0.52	0.79	0.30
16	4	0.29	0.46	0.15	0.34	0.34	0.71	0.31	0.44
16	5	0.17	0.44	0.45	0.48	0.14	0.29	0.30	0.31
16	6	0.14	0.19	0.49	0.22	0.15	0.18	0.46	0.16
17	1	0.16	0.47	0.18	0.46	0.24	0.16	0.10	0.42
17	2	0.18	0.66	0.18	0.33	0.21	0.82	0.19	0.21
17	3	0.08	0.11	0.44	0.24	0.09	0.14	0.74	0.06
17	4	0.26	0.90	0.26	0.67	0.38	0.30	0.68	0.30
17	5	0.17	0.78	0.37	0.59	0.31	0.26	0.54	0.67
17	6*	0.24	0.59	0.57	0.86	0.14	0.22	0.23	0.56
18	1*	0.08	0.38	0.21	0.14	0.24	0.40	0.15	0.30

10	3	0.11	0.13	0.20	0.08	0.18	0.18	0.31	0.19
10	4	0.15	0.30	0.14	0.10	0.16	0.61	0.44	0.18
10	5	0.60	0.58	0.38	0.64	0.15	0.62	0.15	0.48
10	6	0.11	0.10	0.60	0.10	0.44	0.14	0.63	0.17
11	1	0.41	0.31	0.16	0.50	0.43	0.79	0.44	0.06
11	2	0.42	0.24	0.23	0.13	0.33	0.32	0.32	0.42
11	3	0.22	0.77	0.39	0.24	0.35	0.58	0.19	0.14
11	4*	0.28	-	-	-	0.11	-	-	-
11	5	0.31	0.38	0.19	0.18	0.35	0.45	0.10	1.25
11	6	0.39	0.46	0.11	0.16	0.05	0.88	0.33	0.34
12	1	0.33	0.24	0.11	0.56	0.28	0.33	0.22	0.40
12	2*	0.16	0.18	-	0.43	0.27	0.50	0.21	0.34
12	3	0.18	0.45	0.34	0.19	0.22	0.16	0.35	0.20
12	4	0.06	0.12	0.08	0.08	0.04	0.09	0.07	0.05
12	5	0.20	0.06	0.10	0.07	0.22	0.16	0.35	0.20
12	6	0.15	0.12	0.22	0.09	0.11	0.06	0.06	0.12
13	1	0.13	0.47	0.14	0.35	0.13	0.32	0.26	0.22
13	2	0.29	0.65	0.30	0.52	0.31	0.38	0.33	0.35
13	3	0.21	0.14	0.37	0.34	0.35	0.25	0.29	0.36
13	4	0.22	0.31	0.30	0.27	0.33	0.21	0.28	0.61
13	5	0.19	0.43	0.39	0.51	0.26	0.58	0.50	0.38
13	6	0.37	0.27	0.43	0.38	0.14	0.48	0.33	0.14
14	1	0.02	0.43	0.15	0.10	0.03	0.35	0.53	0.11
14	2	0.06	0.33	0.10	0.30	0.09	0.15	0.34	0.13
14	3*	-	-	-	-	-	-	-	-
14	4	0.23	0.42	0.53	0.53	0.18	0.65	0.19	0.38
14	5*	0.07	-	-	-	0.11	0.38	0.32	0.19
14	6*	0.34	0.06	0.59	0.40	0.41	1.09	0.75	0.64
15	1*	0.44	0.61	0.53	0.69	0.09	1.04	0.73	0.64
15	2	0.18	0.32	0.40	0.11	0.05	0.43	0.21	0.23
15	3	0.21	0.11	0.36	0.56	0.20	0.70	0.12	0.36
15	4	0.19	0.31	0.31	0.29	0.09	0.06	0.20	0.29
15	5	0.13	0.35	0.23	0.07	0.06	0.34	0.06	0.12
15	6	0.12	0.07	0.09	0.14	0.31	0.34	0.10	0.19
16	1	0.15	0.21	0.12	0.20	0.13	0.18	0.14	0.25
16	2	0.14	0.18	0.19	0.25	0.24	0.17	0.11	0.06
16	3*	0.18	0.44	0.22	0.34	0.09	0.52	0.79	0.30
16	4	0.29	0.46	0.15	0.34	0.34	0.71	0.31	0.44
16	5	0.17	0.44	0.45	0.48	0.14	0.29	0.30	0.31
16	6	0.14	0.19	0.49	0.22	0.15	0.18	0.46	0.16
17	1	0.16	0.47	0.18	0.46	0.24	0.16	0.10	0.42
17	2	0.18	0.66	0.18	0.33	0.21	0.82	0.19	0.21
17	3	0.08	0.11	0.44	0.24	0.09	0.14	0.74	0.06
17	4	0.26	0.90	0.26	0.67	0.38	0.30	0.68	0.30
17	5	0.17	0.78	0.37	0.59	0.31	0.26	0.54	0.67
17	6*	0.24	0.59	0.57	0.86	0.14	0.22	0.23	0.56
18	1*	0.08	0.38	0.21	0.14	0.24	0.40	0.15	0.30
18	2*	-	-	-	-	-	-	-	-
18	3	0.26	0.29	0.44	0.26	0.22	0.25	0.50	0.09
18	4	0.54	0.94	0.36	0.37	0.23	0.91	0.12	0.07
18	5	0.48	0.45	0.42	0.20	0.47	0.39	0.33	0.09
18	6	0.20	0.14	0.22	0.18	0.09	0.13	0.35	0.42
19	1	0.27	0.34	0.26	0.50	0.18	0.32	0.48	0.17
19	2	0.24	0.43	0.51	0.46	0.13	0.24	0.27	0.06
19	3*	0.17	-	0.15	0.18	0.18	0.19	0.18	0.24
19	4*	-	-	-	-	-	-	-	-
19	5	0.15	0.28	0.37	0.26	0.12	0.44	0.24	0.30
19	6	0.19	0.58	0.44	0.21	0.21	0.54	0.30	0.16
20	1	0.19	0.47	0.35	0.40	0.43	0.21	0.34	0.31
20	2	0.31	0.20	0.32	0.35	0.24	0.27	0.36	0.31
20	3*	0.20	0.59	0.21	0.37	0.08	0.43	0.55	0.67
20	4	0.25	0.60	0.33	0.48	0.41	0.72	0.24	0.60
20	5	0.17	0.53	0.33	0.49	0.16	0.34	0.19	0.53
20	6	0.16	0.44	0.16	0.29	0.30	0.47	0.55	0.13

*Subject not included in analysis.
- Indicates no data.
Values in parenthesis calculated from creatinine.

Table A-2

Individual 17-Ketosteroid and Androgen Values (expressed in milligrams per hour)

Group No.	Subject No.	17-Ketosteroid** (mg/hr)	Androgen (mg/hr)	Androgen / 17-Ketosteroid	Group No	Subject No.	17-Ketosteroid (mg/hr)	Androgen (mg/hr)	Androgen / 17-Ketosteroid
01	1*	0.25	0.231	0.924	11	1	0.42	0.130	0.310
01	2*	0.52	0.201	0.387	11	2	0.38	0.058	0.153
01	3*	0.16	0.069	0.431	11	3	0.29	0.253	0.872
01	4*	0.23	0.198	0.861	11	4*	0.20	0.065	0.325
01	5*	0.33	0.164	0.497	11	5	0.33	0.098	0.297
01	6*	0.31	0.063	0.203	11	6	0.22	0.060	0.273
02	1	0.26	0.164	0.631	12	1	0.31	0.092	0.297
02	2	0.38	0.317	0.834	12	2*	0.22	0.075	0.341
02	3	0.22	0.129	0.586	12	3	0.20	0.076	0.380
02	4	0.30	0.281	0.937	12	4	0.05	0.011	0.220
02	5*	0.16	0.089	0.556	12	5	0.21	0.109	0.519
02	6	0.11	0.020	0.182	12	6	0.13	0.043	0.331
03	1	0.17	0.081	0.476	13	1	0.13	0.117	0.900
03	2	0.13	0.079	0.608	13	2	0.30	0.215	0.717
03	3	0.39	0.231	0.592	13	3	0.27	0.228	0.844
03	4	0.16	0.148	0.925	13	4	0.28	0.073	0.261
03	5	0.29	0.153	0.528	13	5	0.23	0.142	0.617
03	6	0.24	0.096	0.400	13	6	0.26	0.182	0.700
04	1	0.23	0.154	0.670	14	1	0.02	0.003	0.150
04	2	0.35	0.145	0.414	14	2	0.07	0.035	0.500
04	3	0.48	0.142	0.296	14	3*	-	-	-
04	4*	0.17	0.130	0.765	14	4	0.22	0.082	0.373
04	5	0.30	0.092	0.307	14	5*	0.09	0.012	0.133
04	6	0.24	0.119	0.496	14	6*	0.38	0.226	0.595
05	1	0.22	0.117	0.532	15	1*	0.27	0.048	0.178
05	2*	0.18	0.103	0.572	15	2	0.12	0.063	0.525
05	3*‡	0.35	0.042	0.120	15	3	0.21	0.189	0.900
05	4	0.26	0.101	0.388	15	4	0.14	0.118	0.843
05	5	0.26	0.191	0.735	15	5	0.10	0.095	0.950
05	6	0.42	0.347	0.826	15	6	0.22	0.192	0.873
06	1	0.24	0.102	0.425	16	1	0.14	0.138	0.986
06	2	0.39	0.199	0.510	16	2	0.19	0.070	0.368
06	3	0.32	0.114	0.356	16	3*	0.14	0.115	0.821
06	4	0.18	0.109	0.606	16	4	0.32	0.178	0.556
06	5	0.29	0.127	0.438	16	5	0.16	0.054	0.338
06	6	0.13	0.074	0.569	16	6	0.14	0.042	0.300
07	1*	0.35	0.154	0.440	17	1	0.20	0.035	0.175
07	2*	0.30	0.223	0.743	17	2	0.20	0.074	0.370
07	3	0.34	0.151	0.444	17	3	0.09	0.058	0.644
07	4*	0.34	0.137	0.403	17	4	0.32	0.219	0.684
07	5	0.31	0.126	0.406	17	5	0.24	0.138	0.575
07	6	0.26	0.250	0.962	17	6*	0.19	0.160	0.842
08	1	0.24	0.122	0.508	18	1*	0.16	0.041	0.256
08	2	0.23	0.065	0.283	18	2*	-	-	-
08	3	0.26	0.212	0.815	18	3	0.24	0.100	0.417
08	4	0.33	0.105	0.318	18	4	0.14	0.119	0.850
08	5*	0.26	0.157	0.604	18	5	0.48	0.332	0.692
08	6*	0.20	0.072	0.360	18	6	0.15	0.073	0.487
09	1*	0.33	0.093	0.282	19	1	0.23	0.085	0.370
09	2	0.26	0.194	0.746	19	2	0.19	0.103	0.542
09	3*‡‡	0.40	0.316	0.790	19	3*	0.18	0.120	0.667
09	4*‡‡‡	0.52	0.172	0.331	19	4*	-	-	-
09	5	0.18	0.092	0.511	19	5	0.14	0.076	0.543
09	6*	0.38	0.133	0.350	19	6	0.20	0.128	0.640
10	1	0.39	0.391	1.003	20	1	0.26	0.154	0.592
10	2	0.20	0.120	0.600	20	2	0.28	0.122	0.436
10	3	0.15	0.122	0.813	20	3*‡‡‡	0.20	0.092	0.460
10	4	0.16	0.071	0.444	20	4	0.33	0.102	0.309
10	5	0.38	0.096	0.253	20	5	0.17	0.115	0.676
10	6	0.28	0.040	0.143	20	6	0.23	0.093	0.404

* Subject not included in analysis.
** Expressed as the mean of the two basal samples.
‡ Subject ill - dropped from study.
‡‡ First specimen used.
‡‡‡ Second specimen used.

Table A-3

Summary of 17-Ketosteroid Ratios (expressed as a per cent of basal value)

Group No.	Subject No.	Psychological Stress: Pre Stress / Basal X 100	Psychological Stress: Stress / Basal X 100	Psychological Stress: Post Stress / Basal X 100	Tank Stress: Pre Stress / Basal X 100	Tank Stress: Stress / Basal X 100	Tank Stress: Post Stress / Basal X 100
01	1*	102.6	105.3	163.2	200.0	816.7	350.0
01	2*	157.7	175.0	151.9	196.1	209.8	149.0
01	3*	223.5	129.4	170.6	-	-	-
01	4*	21.2	163.6	69.7	458.3	350.0	116.7
01	5*	153.7	102.4	63.4	68.0	136.0	112.0
01	6*	123.5	72.5	107.8	500.0	245.5	645.5
02	1	134.5	175.9	62.1	39.1	82.6	73.9
02	2	115.6	151.1	73.3	53.3	90.0	216.7
02	3	245.8	187.5	91.7	250.0	180.0	400.0
02	4	166.7	200.0	233.3	34.3**	37.1	77.1
02	5*	55.0	210.0	215.0	241.7	425.0	158.3
02	6	200.0	138.5	100.0	400.0	112.5	387.5
03	1	492.3	261.5	192.3	114.2	161.9	309.5
03	2	783.3	350.0	950.0	220.0	135.0	125.0
03	3	167.7	119.4	87.1	68.1	74.5	70.2
03	4	381.3	143.8	212.5	426.7	206.7	173.3
03	5	209.7	71.0	87.1	288.9	177.8	92.6
03	6	54.5	51.5	109.1	593.3	126.7	226.7
04	1	128.0	64.0	156.0	114.3	285.7	228.6
04	2	91.4	140.0	194.3	138.2	58.8	170.6
04	3	240.0	126.0	106.0	152.2**	287.0**	91.3
04	4*	178.9	173.7	142.1	242.9	-	300.0
04	5	200.0	205.4	162.2	354.5	204.5	277.3
04	6	154.1	102.7	67.6	220.0	130.0	170.0
05	1	52.6	105.3	315.8	333.3	226.7	340.0
05	2*	382.4	235.3	100.0	189.5	347.4**	615.8**
05	3*	-	-	-	-	-	-
05	4	55.2	24.1	151.7	334.8	152.2	234.8
05	5	123.5	300.0	176.5	227.8	144.4	344.4
05	6	46.3	79.1	92.5	352.4	181.0	181.0
06	1	273.3	320.0	246.7	178.6	189.3	214.3
06	2	127.9	167.4	160.5	197.2	205.7	165.7
06	3	96.9	59.4	106.3	183.9	171.0	241.9
06	4	83.3	305.6	72.2	361.1	288.9	127.8
06	5	231.6	168.4	336.8	165.8	131.6	131.6
06	6	120.0	186.7	80.0	80.0	230.0	340.0
07	1*	106.5	60.9	93.5	258.3	241.7	179.2
07	2*	226.5	-	47.1	172.0	236.0	248.0
07	3	160.7	147.5	104.9	1542.9	1228.6	2628.6
07	4*	236.4	104.5	209.1	115.6	117.8	-
07	5	168.6	142.9	162.9	255.6	200.0	140.7
07	6	259.1	127.3	186.4	168.7	93.8	234.4
08	1	285.2	203.7	163.0	240.0	110.0	200.0
08	2	131.3	231.3	118.8	33.3	100.0	43.3
08	3	323.8	338.1	152.4	132.3	200.0	219.4
08	4	196.7	126.7	133.3	102.8	172.2	138.9
08	5*	405.9	176.5	129.4	113.5	86.5	154.1
08	6*	310.0	-	170.0	350.0	175.0	195.0
09	1*	170.0	110.0	176.7	48.6	185.7	131.4
09	2	136.0	160.0	196.0	165.4	180.8	200.0
09	3*	90.0	-	107.5	127.8**	72.2**	177.8**
09	4*	-	-	-	146.2	73.1	100.0
09	5	206.3	187.5	56.3	165.0	170.0	190.0
09	6*	72.0	104.0	50.0	156.0	100.0	124.0
10	1	61.5	115.4	84.6	157.7	121.2	138.5
10	2	185.7	128.6	257.1	100.0	48.5	148.5

10	1	61.5	115.4	84.6	157.7	121.2	138.5
10	2	185.7	128.6	257.1	100.0	48.5	148.5
10	3	118.2	181.9	72.7	100.0	172.2	105.6
10	4	200.0	93.3	66.7	381.3	275.0	112.5
10	5	96.7	63.3	106.7	413.3	100.0	320.0
10	6	90.9	545.5	90.9	31.8	143.2	38.6
11	1	75.6	39.0	122.0	183.7	102.3	14.0
11	2	57.1	54.8	31.0	97.0	157.6	127.3
11	3	350.0	177.3	109.1	165.7	54.3	40.0
11	4*	-	-	-	-	-	-
11	5	122.6	61.3	58.1	208.6	28.6	191.4
11	6	117.9	28.2	41.0	1760.0	660.0	680.0
12	1	72.7	33.3	169.7	117.9	78.6	142.9
12	2*	112.5	-	268.8	185.2	77.8	125.9
12	3	250.0	188.9	105.6	72.7	159.1	90.9
12	4	200.0	133.3	133.3	225.0	175.0	125.0
12	5	30.0	50.0	35.0	72.7	159.1	90.9
12	6	80.0	146.7	60.0	54.5	54.5	109.1
13	1	361.5	107.7	269.2	246.2	200.0	169.2
13	2	224.1	103.4	55.2	122.6	106.5	112.9
13	3	66.7	176.2	161.9	71.4	82.9	102.9
13	4	140.9	136.4	122.7	63.6	84.8	184.8
13	5	226.3	205.3	300.0	223.1	192.3	146.2
13	6	73.0	86.5	102.7	342.9	235.7	100.0
14	1	2150.0	750.0	500.0	1166.7	1766.7	366.7
14	2	550.0	166.7	500.0	166.7	377.8	144.4
14	3*	-	-	-	-	-	-
14	4	182.6	230.4	230.4	361.1	105.6	211.1
14	5*	-	-	-	345.5	290.9	172.7
14	6*	17.6	173.5	117.6	265.9	182.9	156.1
15	1*	138.6	120.5	156.8	833.3	811.1	711.1
15	2	177.8	222.2	61.1	860.0	420.0	460.0
15	3	52.4	171.4	266.7	350.0	60.0	180.0
15	4	163.2	163.2	152.6	66.7	222.2	322.2
15	5	269.2	176.9	53.8	566.7	100.0	200.0
15	6	58.3	75.0	116.7	109.7	32.3	61.3
16	1	140.0	80.0	133.3	138.5	107.7	192.3
16	2	128.6	135.7	257.1	70.8	45.8	25.0
16	3*	244.4	122.2	188.9	577.8	877.8	333.3
16	4	158.6	51.7	117.2	147.1	91.2	108.8
16	5	258.8	264.7	282.4	207.1	214.3	221.4
16	6	135.7	350.0	157.1	120.0	306.7	106.7
17	1	237.5	112.5	287.5	66.7	41.7	175.0
17	2	366.7	100.0	183.3	390.5	90.5	100.0
17	3	137.5	550.0	300.0	155.6	822.2	66.7
17	4	300.0	100.0	257.7	78.9	178.9	78.9
17	5	458.8	217.6	347.1	83.9	174.2	216.1
17	6*	245.8	237.5	358.3	157.1	164.3	400.0
18	1*	475.0	262.5	175.0	166.7	62.5	125.0
18	2*	-	-	-	-	-	-
18	3	111.5	169.2	100.0	113.6	227.3	40.9
18	4	174.1	66.7	68.5	395.7	52.2	30.4
18	5	93.8	87.5	41.7	83.0	70.2	19.1
18	6	70.0	110.0	90.0	144.4	388.9	466.7
19	1	125.9	96.3	185.2	177.8	266.7	94.4
19	2	179.2	87.5	191.7	184.6	207.7	46.2
19	3*	-	88.2	105.9	105.6	100.0	133.3
19	4*	-	-	-	-	-	-
19	5	186.7	246.7	173.3	366.7	200.0	250.0
19	6	305.3	231.6	110.5	514.3	314.3	76.2
20	1	247.4	184.2	210.5	48.8	79.1	72.1
20	2	64.5	103.2	112.9	112.5	150.0	129.2
20	3*	295.0	105.0	185.0	537.5	687.5	837.5
20	4	240.0	132.0	192.0	175.6	58.5	146.3

2

10	6	90.9	545.5	90.9	31.8	143.2	38.6
11	1	75.6	39.0	122.0	183.7	102.3	14.0
11	2	57.1	54.8	31.0	97.0	157.6	127.3
11	3	350.0	177.3	109.1	165.7	54.3	40.0
11	4*	-	-	-	-	-	-
11	5	122.6	61.3	58.1	208.6	28.6	191.4
11	6	117.9	28.2	41.0	1760.0	660.0	680.0
12	1	72.7	33.3	169.7	117.9	78.6	142.9
12	2*	112.5	-	268.8	185.2	77.8	125.9
12	3	250.0	188.9	105.6	72.7	159.1	90.9
12	4	200.0	133.3	133.3	225.0	175.0	125.0
12	5	30.0	50.0	35.0	72.7	159.1	90.9
12	6	80.0	146.7	60.0	54.5	54.5	109.1
13	1	361.5	107.7	269.2	246.2	200.0	169.2
13	2	224.1	103.4	55.2	122.6	106.5	112.9
13	3	66.7	176.2	161.9	71.4	82.9	102.9
13	4	140.9	136.4	122.7	63.6	84.8	184.8
13	5	226.3	205.3	300.0	223.1	192.3	146.2
13	6	73.0	86.5	102.7	342.9	235.7	100.0
14	1	2150.0	750.0	500.0	1166.7	1766.7	366.7
14	2	550.0	166.7	500.0	166.7	377.8	144.4
14	3*	-	-	-	-	-	-
14	4	182.6	230.4	230.4	361.1	105.6	211.1
14	5*	-	-	-	345.5	290.9	172.7
14	6*	17.6	173.5	117.6	265.9	182.9	156.1
15	1*	138.6	120.5	156.8	833.3	811.1	711.1
15	2	177.8	222.2	61.1	860.0	420.0	460.0
15	3	52.4	171.4	266.7	350.0	60.0	180.0
15	4	163.2	163.2	152.6	66.7	222.2	322.2
15	5	269.2	176.9	53.8	566.7	100.0	200.0
15	6	58.3	75.0	116.7	109.7	32.3	61.3
16	1	140.0	80.0	133.3	138.5	107.7	192.3
16	2	128.6	135.7	257.1	70.8	45.8	25.0
16	3*	244.4	122.2	188.9	577.8	877.8	333.3
16	4	158.6	51.7	117.2	147.1	91.2	108.8
16	5	258.8	264.7	282.4	207.1	214.3	221.4
16	6	135.7	350.0	157.1	120.0	306.7	106.7
17	1	237.5	112.5	287.5	66.7	41.7	175.0
17	2	366.7	100.0	183.3	390.5	90.5	100.0
17	3	137.5	550.0	300.0	155.6	822.2	66.7
17	4	300.0	100.0	257.7	78.9	178.9	78.9
17	5	458.8	217.6	347.1	83.9	174.2	216.1
17	6*	245.8	237.5	358.3	157.1	164.3	400.0
18	1*	475.0	262.5	175.0	166.7	62.5	125.0
18	2*	-	-	-	-	-	-
18	3	111.5	169.2	100.0	113.6	227.3	40.9
18	4	174.1	66.7	68.5	395.7	52.2	30.4
18	5	93.8	87.5	41.7	83.0	70.2	19.1
18	6	70.0	110.0	90.0	144.4	388.9	466.7
19	1	125.9	96.3	185.2	177.8	266.7	94.4
19	2	179.2	87.5	191.7	184.6	207.7	46.2
19	3*	-	88.2	105.9	105.6	100.0	133.3
19	4*	-	-	-	-	-	-
19	5	186.7	246.7	173.3	366.7	200.0	250.0
19	6	305.3	231.6	110.5	514.3	314.3	76.2
20	1	247.4	184.2	210.5	48.8	79.1	72.1
20	2	64.5	103.2	112.9	112.5	150.0	129.2
20	3*	295.0	105.0	185.0	537.5	687.5	837.5
20	4	240.0	132.0	192.0	175.6	58.5	146.3
20	5	311.8	194.1	288.2	212.5	118.8	331.3
20	6	275.0	100.0	181.3	156.7	183.3	43.3

* Subject not included in analysis.

** Calculated from creatinine value.

\- Indicates no data.

Table A-4

Individual Creatinine Values (expressed as grams per 24 hours)

Group No.	Subject No.	Psychological Stress Basal	Psychological Stress Pre Stress	Psychological Stress Stress	Psychological Stress Post Stress	Tank Stress Basal	Tank Stress Pre Stress	Tank Stress Stress	Tank Stress Post Stress
01	1*	2.32	1.61	1.97	3.56	2.28	3.41	1.74	2.27
01	2*	1.78	1.98	2.25	2.63	1.26	1.72	2.16	2.30
01	3*	1.34	1.52	1.81	1.46	1.33	-	-	-
01	4*	1.73	1.65	1.73	1.93	1.35	1.30	1.37	1.76
01	5*	1.93	1.86	2.29	2.07	1.09	2.04	1.49	1.54
01	6*	1.61	1.49	1.58	1.76	1.34	1.09	1.46	2.69
02	1	1.70	1.97	1.92	2.00	1.48	-	2.79	3.79
02	2	0.97	1.57	1.48	1.50	0.94	0.86	2.04	1.58
02	3	1.46	1.71	1.48	1.84	2.80	1.32	1.76	1.68
02	4	1.57	1.94	1.86	1.71	1.41	0.82	2.50	2.12
02	5*	1.31	0.98	1.78	1.52	1.19	0.88	2.13	2.35
02	6	1.36	1.59	1.58	1.57	1.41	1.78	3.42	2.04
03	1	0.46	1.47	1.72	0.87	1.61	1.80	1.43	2.39
03	2	1.32	1.50	1.31	1.27	0.72	0.69	0.91	0.80
03	3	1.39	2.52	1.90	1.46	1.41	2.24	2.74	1.92
03	4	1.04	1.15	1.27	1.46	1.08	1.94	1.89	1.70
03	5	1.13	1.63	2.03	1.04	1.18	1.63	0.99	1.53
03	6	1.43	1.89	1.89	1.56	1.47	1.47	0.80	1.20
04	1	1.03	1.64	1.72	1.59	1.19	1.39	1.46	1.37
04	2	1.13	1.40	1.93	2.57	1.48	2.10	1.94	2.70
04	3	1.38	2.35	2.55	1.88	1.39	0.81	0.75	2.31
04	4*	1.62	1.60	1.78	2.00	1.17	1.56	3.16	1.89
04	5	1.19	2.41	2.41	2.15	1.04	2.44	2.41	1.82
04	6	1.58	1.38	1.86	2.14	1.57	1.97	2.29	1.68
05	1	1.68	2.48	1.49	2.64	1.18	2.14	2.26	2.42
05	2*	1.31	1.87	1.31	0.94	1.68	1.62	0.56	0.62
05	3*	0.95	1.12	1.33	0.76	-	-	-	-
05	4	0.83	1.71	1.80	1.60	1.47	1.63	1.93	1.54
05	5	0.72	1.87	1.94	2.03	1.21	2.01	1.60	1.49
05	6	1.26	1.51	1.36	1.77	1.96	2.21	1.41	2.22
06	1	1.54	1.52	1.25	1.83	1.25	1.64	1.56	2.37
06	2	2.09	2.30	2.05	2.22	1.28	1.70	1.73	1.62
06	3	1.49	2.05	1.73	1.87	1.30	1.63	1.48	1.82
06	4	1.50	2.25	1.38	1.93	1.64	1.03	1.73	1.72
06	5	1.21	1.37	1.97	2.05	1.28	2.12	2.15	2.25
06	6	1.11	1.84	1.66	1.78	1.02	1.81	1.70	1.48
07	1*	0.92	1.90	1.04	2.21	1.76	1.00	2.14	1.89
07	2*	0.92	1.55	1.89	1.81	1.27	1.65	2.09	1.62
07	3	1.55	2.13	1.90	2.05	2.03	1.54	2.51	3.45
07	4*	1.44	2.25	2.41	0.90	1.59	2.44	2.50	0.54
07	5	1.35	2.16	2.57	2.31	1.60	1.76	2.21	1.60
07	6	1.58	1.43	1.82	1.41	1.71	1.59	1.66	1.90
08	1	1.31	2.36	1.83	1.41	1.67	2.48	2.51	1.94
08	2	1.90	1.61	3.26	2.21	1.75	0.63	2.58	2.22
08	3	1.50	2.00	1.77	2.21	0.97	1.49	2.11	2.75
08	4	1.73	1.86	2.03	2.32	1.05	0.76	2.25	1.85
08	5*	1.71	2.45	2.30	2.16	2.70	2.01	2.45	2.65
08	6*	1.34	1.98	1.98	1.52	1.17	1.95	2.49	1.66
09	1*	1.19	1.38	1.68	1.87	0.92	1.22	1.55	1.29
09	2	1.31	1.77	2.34	1.97	1.09	1.31	1.74	0.53
09	3*	1.32	1.58	1.43	1.70	0.78	1.12	1.12	1.42
09	4*	1.70	1.59	2.09	2.40	1.27	1.45	1.37	1.63
09	5	1.46	1.59	1.63	1.73	1.08	1.10	1.27	0.52
09	6*	0.95	0.60	1.18	0.86	-	-	-	-
10	1	1.76	1.68	2.15	2.15	1.40	1.86	2.35	1.91
10	2	1.13	1.93	2.08	2.51	1.38	1.54	2.56	2.03
10	3	1.03	1.05	1.26	1.42	1.27	1.38	1.61	1.79
10	4	1.40	2.49	2.33	3.00	1.23	1.43	1.61	1.76
10	5	1.46	2.61	2.16	3.20	1.79	2.33	2.41	3.02
10	6	1.75	1.85	1.64	2.68	1.73	1.59	1.97	2.26
11	1	1.18	1.68	2.55	1.84	1.04	1.24	0.64	1.80
11	2	1.36	2.64	1.47	2.35	1.41	1.68	3.06	2.27

Table A-4

Individual Creatinine Values (expressed as grams per 24 hours)

Group No.	Subject No.	Psychological Stress: Basal	Psychological Stress: Pre Stress	Psychological Stress: Stress	Psychological Stress: Post Stress	Tank Stress: Basal	Tank Stress: Pre Stress	Tank Stress: Stress	Tank Stress: Post Stress
01	1*	2.32	1.61	1.97	3.56	2.28	3.41	1.74	2.27
01	2*	1.78	1.98	2.25	2.63	1.26	1.72	2.16	2.30
01	3*	1.34	1.52	1.81	1.46	1.33	-	-	-
01	4*	1.73	1.65	1.73	1.93	1.35	1.30	1.37	1.76
01	5*	1.93	1.86	2.29	2.07	1.09	2.04	1.49	1.54
01	6*	1.61	1.49	1.58	1.76	1.34	1.09	1.46	2.69
02	1	1.70	1.97	1.92	2.00	1.48	-	2.79	3.79
02	2	0.97	1.57	1.48	1.50	0.94	0.86	2.04	1.58
02	3	1.46	1.71	1.48	1.84	2.80	1.32	1.76	1.68
02	4	1.57	1.94	1.86	1.71	1.41	0.82	2.50	2.12
02	5*	1.31	0.98	1.78	1.52	1.19	0.88	2.13	2.35
02	6	1.36	1.59	1.58	1.57	1.41	1.78	3.42	2.04
03	1	0.46	1.47	1.72	0.87	1.61	1.[illegible]0	1.43	2.39
03	2	1.32	1.50	1.31	1.27	0.72	0.69	0.91	0.80
03	3	1.39	2.52	1.90	1.46	1.41	2.24	2.74	1.92
03	4	1.04	1.15	1.27	1.46	1.08	1.94	1.89	1.70
03	5	1.13	1.63	2.03	1.04	1.18	1.63	0.99	1.53
03	6	1.43	1.89	1.89	1.56	1.47	1.47	0.80	1.20
04	1	1.03	1.64	1.72	1.59	1.19	1.39	1.46	1.37
04	2	1.13	1.40	1.93	2.57	1.48	2.10	1.94	2.70
04	3	1.38	2.35	2.55	1.88	1.39	0.81	0.75	2.31
04	4*	1.62	1.60	1.78	2.00	1.17	1.56	3.16	1.89
04	5	1.19	2.41	2.41	2.15	1.04	2.44	2.41	1.82
04	6	1.58	1.38	1.86	2.14	1.57	1.97	2.29	1.68
05	1	1.68	2.48	1.49	2.64	1.18	2.14	2.26	2.42
05	2*	1.31	1.87	1.31	0.94	1.68	1.62	0.56	0.62
05	3*	0.95	1.12	1.33	0.76	-	-	-	-
05	4	0.83	1.71	1.80	1.60	1.47	1.63	1.93	1.54
05	5	0.72	1.87	1.94	2.03	1.21	2.01	1.60	1.49
05	6	1.26	1.51	1.36	1.77	1.96	2.21	1.41	2.22
06	1	1.54	1.52	1.25	1.83	1.25	1.64	1.56	2.37
06	2	2.09	2.30	2.05	2.22	1.28	1.70	1.73	1.62
06	3	1.49	2.05	1.73	1.87	1.30	1.63	1.48	1.82
06	4	1.50	2.25	1.38	1.93	1.64	1.03	1.73	1.72
06	5	1.21	1.37	1.97	2.05	1.28	2.12	2.15	2.25
06	6	1.11	1.84	1.66	1.78	1.02	1.81	1.70	1.48
07	1*	0.92	1.90	1.04	2.21	1.76	1.00	2.14	1.89
07	2*	0.92	1.55	1.89	1.81	1.27	1.65	2.09	1.62
07	3	1.55	2.13	1.90	2.05	2.03	1.54	2.51	3.45
07	4*	1.44	2.25	2.41	0.90	1.59	2.44	2.50	0.54
07	5	1.35	2.16	2.57	2.31	1.60	1.76	2.21	1.60
07	6	1.58	1.43	1.82	1.41	1.71	1.59	1.66	1.90
08	1	1.31	2.36	1.83	1.41	1.67	2.48	2.51	1.94
08	2	1.90	1.61	3.26	2.21	1.75	0.63	2.58	2.22
08	3	1.50	2.00	1.77	2.21	0.97	1.49	2.11	2.75
08	4	1.73	1.86	2.03	2.32	1.05	0.76	2.25	1.85
08	5*	1.71	2.45	2.30	2.16	2.70	2.01	2.45	2.65
08	6*	1.34	1.98	1.98	1.52	1.17	1.95	2.49	1.66
09	1*	1.19	1.38	1.68	1.87	0.92	1.22	1.55	1.29
09	2	1.31	1.77	2.34	1.97	1.09	1.31	1.74	0.53
09	3*	1.32	1.58	1.43	1.70	0.78	1.12	1.12	1.42
09	4*	1.70	1.59	2.09	2.40	1.27	1.45	1.37	1.63
09	5	1.46	1.59	1.63	1.73	1.08	1.10	1.27	0.52
09	6*	0.95	0.60	1.18	0.86	-	-	-	-
10	1	1.76	1.68	2.15	2.15	1.40	1.86	2.35	1.91

10	1	1.76	1.68	2.15	2.15	1.40	1.86	2.35	1.91
10	2	1.13	1.93	2.08	2.51	1.38	1.54	2.56	2.03
10	3	1.03	1.05	1.26	1.42	1.27	1.38	1.61	1.79
10	4	1.40	2.49	2.33	3.00	1.23	1.43	1.61	1.76
10	5	1.46	2.61	2.16	3.20	1.79	2.33	2.41	3.02
10	6	1.75	1.85	1.64	2.68	1.73	1.59	1.97	2.26
11	1	1.18	1.68	2.55	1.84	1.04	1.24	0.64	1.80
11	2	1.36	2.64	1.47	2.35	1.41	1.68	3.06	2.27
11	3	1.14	2.26	2.06	1.64	1.42	2.21	2.61	1.57
11	4*	1.73	-	-	-	1.63	-	-	-
11	5	1.21	2.61	2.44	3.01	1.65	1.83	2.16	2.13
11	6	1.39	2.64	2.44	1.61	1.97	2.91	1.67	2.49
12	1	1.77	2.04	1.56	1.72	1.33	2.12	1.94	1.99
12	2*	1.64	2.45	-	2.04	1.33	1.79	2.10	2.17
12	3	1.47	2.24	2.24	2.66	1.40	2.05	2.13	2.50
12	4	1.57	2.86	2.37	2.60	1.38	2.80	2.11	2.81
12	5	1.09	2.03	1.72	1.82	1.07	1.74	1.39	1.53
12	6	1.48	2.65	1.92	2.30	1.22	2.29	1.87	2.33
13	1	1.06	1.89	1.54	2.12	1.21	1.55	1.68	1.64
13	2	1.71	2.27	2.24	2.49	1.77	1.93	2.48	2.13
13	3	1.21	2.52	1.86	2.65	1.48	1.65	1.86	1.94
13	4	1.17	2.11	1.70	2.43	1.63	1.97	1.66	2.19
13	5	1.33	2.50	2.20	2.64	2.06	2.36	2.36	2.06
13	6	1.87	2.34	2.14	2.36	1.40	2.20	2.09	2.27
14	1	2.70	1.54	2.29	1.93	1.36	1.88	2.06	1.95
14	2	2.80	1.11	1.80	0.90	1.25	1.69	1.78	1.74
14	3*	-	-	-	-	-	-	-	-
14	4	2.51	1.11	1.62	2.25	0.98	1.25	1.76	1.74
14	5*	2.66	1.42	1.66	1.90	1.31	-	-	-
14	6*	2.47	1.87	2.65	2.51	1.40	2.06	2.25	2.25
15	1*	2.26	1.52	1.81	2.04	1.54	2.60	2.42	2.22
15	2	2.65	1.28	1.10	1.67	1.76	1.72	2.31	1.68
15	3	2.16	1.35	2.00	1.54	1.27	1.87	1.97	1.72
15	4	1.87	1.66	1.92	1.48	1.59	0.88	1.83	2.60
15	5	1.78	1.32	1.78	1.72	1.55	1.78	2.09	1.80
15	6	2.06	2.01	1.61	1.63	1.48	1.42	1.56	1.73
16	1	1.84	1.26	2.80	1.71	1.10	1.90	2.44	1.62
16	2	2.29	1.04	2.00	1.26	1.38	1.34	1.80	1.73
16	3*	2.55	1.29	2.16	1.74	1.38	1.45	1.44	2.04
16	4	3.80	2.35	4.50	2.62	2.35	1.80	1.52	1.86
16	5	3.75	1.43	1.92	1.78	1.30	1.65	1.90	1.88
16	6	2.80	2.00	2.48	3.46	1.54	1.49	2.42	2.25
17	1	1.82	1.34	1.50	1.69	1.26	2.00	1.92	1.82
17	2	2.10	1.20	1.90	1.56	1.92	2.25	1.81	1.92
17	3	1.69	1.50	1.58	1.62	1.36	1.62	2.50	1.36
17	4	2.43	1.73	2.45	1.85	1.54	2.12	2.18	2.12
17	5	2.12	1.47	1.96	1.80	1.50	1.92	2.26	2.24
17	6*	2.45	1.90	2.12	2.12	1.62	2.17	2.04	3.06
18	1*	2.54	1.82	2.55	3.26	2.75	2.58	2.60	1.34
18	2*	-	-	-	-	-	-	-	-
18	3	1.92	1.01	1.98	1.71	1.60	1.83	1.88	2.31
18	4	2.61	1.58	3.28	2.00	1.60	2.00	3.20	2.11
18	5	2.06	2.26	2.30	2.80	1.51	3.45	2.85	4.15
18	6	2.49	1.52	2.49	2.14	2.00	2.56	2.29	2.26
19	1	2.44	1.88	2.80	2.04	1.38	2.30	3.70	1.88
19	2	2.97	2.40	2.55	2.95	2.28	1.68	2.29	2.49
19	3*	1.64	1.52	1.96	2.15	1.18	2.23	3.30	2.09
19	4*	-	-	-	-	-	-	-	-
19	5	2.40	1.56	1.44	1.78	1.04	2.41	1.80	1.78
19	6	2.77	2.05	2.59	2.84	1.83	2.50	2.74	3.61
20	1	2.55	1.61	1.80	1.68	1.78	1.95	2.74	2.11
20	2	2.56	1.30	1.98	2.40	1.34	1.85	2.36	1.48
20	3*	2.09	1.24	2.21	1.62	2.09	1.86	2.74	1.84
20	4	3.00	1.84	3.41	2.09	1.76	1.64	2.31	2.90
20	5	1.54	1.52	2.94	2.10	1.32	2.46	3.00	2.20

2

10	5	1.46	2.61	2.16	3.20	1.79	2.33	2.41	3.02
10	6	1.75	1.85	1.64	2.68	1.73	1.59	1.97	2.26
11	1	1.18	1.68	2.55	1.84	1.04	1.24	0.64	1.80
11	2	1.36	2.64	1.47	2.35	1.41	1.68	3.06	2.27
11	3	1.14	2.26	2.06	1.64	1.42	2.21	2.61	1.57
11	4*	1.73	-	-	-	1.63	-	-	-
11	5	1.21	2.61	2.44	3.01	1.65	1.83	2.16	2.13
11	6	1.39	2.64	2.44	1.61	1.97	2.91	1.67	2.49
12	1	1.77	2.04	1.56	1.72	1.33	2.12	1.94	1.99
12	2*	1.64	2.45	-	2.04	1.33	1.79	2.10	2.17
12	3	1.47	2.24	2.24	2.66	1.40	2.05	2.13	2.50
12	4	1.57	2.86	2.37	2.60	1.38	2.80	2.11	2.81
12	5	1.09	2.03	1.72	1.82	1.07	1.74	1.39	1.53
12	6	1.48	2.65	1.92	2.30	1.22	2.29	1.87	2.33
13	1	1.06	1.89	1.54	2.12	1.21	1.55	1.68	1.64
13	2	1.71	2.27	2.24	2.49	1.77	1.93	2.48	2.13
13	3	1.21	2.52	1.86	2.65	1.48	1.65	1.86	1.94
13	4	1.17	2.11	1.70	2.43	1.63	1.97	1.66	2.19
13	5	1.33	2.50	2.20	2.64	2.06	2.36	2.36	2.06
13	6	1.87	2.34	2.14	2.36	1.40	2.20	2.09	2.27
14	1	2.70	1.54	2.29	1.93	1.36	1.88	2.06	1.95
14	2	2.80	1.11	1.80	0.90	1.25	1.69	1.78	1.74
14	3*	-	-	-	-	-	-	-	-
14	4	2.51	1.11	1.62	2.25	0.98	1.25	1.76	1.74
14	5*	2.66	1.42	1.66	1.90	1.31	-	-	-
14	6*	2.47	1.87	2.65	2.51	1.40	2.06	2.25	2.25
15	1*	2.26	1.52	1.81	2.04	1.54	2.60	2.42	2.22
15	2	2.65	1.28	1.10	1.67	1.76	1.72	2.31	1.68
15	3	2.16	1.35	2.00	1.54	1.27	1.87	1.97	1.72
15	4	1.87	1.66	1.92	1.48	1.59	0.88	1.83	2.60
15	5	1.78	1.32	1.78	1.72	1.55	1.78	2.09	1.80
15	6	2.06	2.01	1.61	1.63	1.48	1.42	1.56	1.73
16	1	1.84	1.26	2.80	1.71	1.10	1.90	2.44	1.62
16	2	2.29	1.04	2.00	1.26	1.38	1.34	1.80	1.73
16	3*	2.55	1.29	2.16	1.74	1.38	1.45	1.44	2.04
16	4	3.80	2.35	4.50	2.62	2.35	1.80	1.52	1.86
16	5	3.75	1.43	1.92	1.78	1.30	1.65	1.90	1.88
16	6	2.80	2.00	2.48	3.46	1.54	1.49	2.42	2.25
17	1	1.82	1.34	1.50	1.69	1.26	2.00	1.92	1.82
17	2	2.10	1.20	1.90	1.56	1.92	2.25	1.81	1.92
17	3	1.69	1.50	1.58	1.62	1.36	1.62	2.50	1.36
17	4	2.43	1.73	2.45	1.85	1.54	2.12	2.18	2.12
17	5	2.12	1.47	1.96	1.80	1.50	1.92	2.26	2.24
17	6*	2.45	1.90	2.12	2.12	1.62	2.17	2.04	3.06
18	1*	2.54	1.82	2.55	3.26	2.75	2.58	2.60	1.34
18	2*	-	-	-	-	-	-	-	-
18	3	1.92	1.01	1.98	1.71	1.60	1.83	1.88	2.31
18	4	2.61	1.58	3.28	2.00	1.60	2.00	3.20	2.11
18	5	2.06	2.26	2.30	2.80	1.51	3.45	2.85	4.15
18	6	2.49	1.52	2.49	2.14	2.00	2.56	2.29	2.26
19	1	2.44	1.88	2.80	2.04	1.38	2.30	3.70	1.88
19	2	2.97	2.40	2.55	2.95	2.28	1.68	2.29	2.49
19	3*	1.64	1.52	1.96	2.15	1.18	2.23	3.30	2.09
19	4*	-	-	-	-	-	-	-	-
19	5	2.40	1.56	1.44	1.78	1.04	2.41	1.80	1.78
19	6	2.77	2.05	2.59	2.84	1.83	2.50	2.74	3.61
20	1	2.55	1.61	1.80	1.68	1.78	1.95	2.74	2.11
20	2	2.56	1.30	1.98	2.40	1.34	1.85	2.36	1.48
20	3*	2.09	1.24	2.21	1.62	2.09	1.86	2.74	1.84
20	4	3.00	1.84	3.41	2.09	1.76	1.64	2.31	2.90
20	5	1.54	1.52	2.94	2.10	1.32	2.46	3.00	2.20
20	6	3.01	1.00	1.64	2.70	1.28	1.42	0.51	2.25

***** Subject not included in analysis.

\- Indicates no data.

Table A-5

Summary of Variables for 17-Ketosteroid Study With Their Means and Standard Deviations
Population = 85

Variable No.	Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01	17-Ketosteroid Output - Basal	P*	Milligrams per Hour	0.247	± 0.130
02	17-Ketosteroid Output - Pre Stress	P	Milligrams per Hour	0.356	± 0.223
03	17-Ketosteroid Output - Stress	P	Milligrams per Hour	0.294	± 0.191
04	17-Ketosteroid Output - Post Stress	P	Milligrams per Hour	0.344	± 0.180
05	17-Ketosteroid Output - Basal	T**	Milligrams per Hour	0.233	± 0.115
06	17-Ketosteroid Output - Pre Stress	T	Milligrams per Hour	0.399	± 0.249
07	17-Ketosteroid Output - Stress	T	Milligrams per Hour	0.346	± 0.222
08	17-Ketosteroid Output - Post Stress	T	Milligrams per Hour	0.338	± 0.269
09	Age	-	Years	18.470	± 1.310
10	Creatinine Output - Basal	P	Grams per 24 Hours	1.784	± 0.650
11	Creatinine Output - Pre Stress	P	Grams per 24 Hours	1.797	± 0.463
12	Creatinine Output - Stress	P	Grams per 24 Hours	2.017	± 0.545
13	Creatinine Output - Post Stress	P	Grams per 24 Hours	2.046	± 0.504
14	Creatinine Output - Basal	T	Grams per 24 Hours	1.458	± 0.356
15	Creatinine Output - Pre Stress	T	Grams per 24 Hours	1.793	± 0.493
16	Creatinine Output - Stress	T	Grams per 24 Hours	2.004	± 0.552
17	Creatinine Output - Post Stress	T	Grams per 24 Hours	1.985	± 0.561
18	17-Ketosteroid Output (av. var. 01 and 05)	-	Milligrams per Hour	0.240	± 0.093
19	Androgen Output	-	Milligrams per Hour	0.119	± 0.070
20	Total Testicular Volume	-	Cubic Centimeters	43.607	±14.407

* P = Psychological Stress.

** T = Tank Stress.

Table A-6

Intercorrelations and Residuals of Variables in 17-Ketosteroid Study
Population = 85; Significance Levels: P = 0.05, |r| ≥ 0.21; P = 0.01, |r| ≥ 0.28

Residuals

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
01		.05	.07	-.03	-.06	.10	.00	-.05	-.04	.05	-.03	-.03	-.06	.07	.03	.01	.07	.01	.04	.05
02	.42		.05	.02	.07	-.03	.00	-.02	-.03	-.07	.03	.08	-.09	.09	-.03	-.03	.01	.00	-.07	.05
03	.40	.39		.04	-.08	-.09	.09	.05	-.04	.00	.00	-.08	.09	-.02	.00	.08	.03	.01	-.01	-.07
04	.52	.41	.38		-.06	-.02	-.07	.01	.00	.08	-.03	.08	.07	-.09	.03	.00	.02	-.02	-.02	-.03
05	.20	.13	.09	.17		.05	-.03	-.02	-.01	-.01	.03	.03	.02	.06	.00	.02	.03	.03	.07	.00
06	.55	.40	.28	.39	.21		-.08	-.01	.07	.02	-.03	.08	.04	.10	.06	-.05	-.01	.08	.09	.08
07	.25	.34	.41	.24	.25	.31		-.01	.01	.01	.00	-.07	-.01	.01	-.07	-.02	.02	.01	.00	-.01
08	.31	.35	.40	.39	.13	.39	.34		-.06	-.04	.00	-.04	-.02	.10	-.01	.01	-.06	.00	-.07	.03
09	.05	.03	-.01	.14	.08	.15	.14	-.01		.01	.03	.07	-.06	-.05	.07	.03	.03	-.07	.08	.00
10	-.18	.05	-.08	.00	-.09	-.01	.00	-.23	.04		-.08	.02	.02	.04	-.09	-.09	.07	-.03	.00	.05
11	.25	.08	.08	-.06	.14	.13	.03	.10	.04	-.29		-.02	-.05	.04	.01	.00	-.07	.04	.01	.00
12	.11	.23	-.07	.08	.18	.18	-.04	-.10	.09	.40	.20		-.09	.07	-.05	.05	-.08	-.08	-.02	-.06
13	.13	-.08	.07	-.04	.18	.10	-.04	-.10	-.05	.10	.51	.33		.03	-.08	.03	.03	.03	.00	.01
14	.13	.21	.00	-.07	.03	.18	-.04	.10	-.04	.26	.20	.32	.23		-.02	.03	.04	.05	.02	.05
15	.14	.06	-.01	.08	-.12	.12	-.28	-.04	.05	.06	.24	.16	.19	.25		-.05	.05	.08	.07	-.07
16	.08	.09	.09	.05	-.05	.02	-.18	-.04	-.02	.17	.13	.30	.28	.28	.40		.04	.04	-.06	-.02
17	.29	.21	.15	.11	.14	.20	.07	.05	.03	.16	.29	.22	.41	.28	.36	.33		.09	-.04	-.08
18	.74	.29	.33	.48	.73	.46	.37	.35	.09	-.22	.28	.12	.22	.08	.02	-.04	.28		.07	-.05
19	.40	.12	.25	.24	.53	.32	.14	.20	-.10	-.17	.08	.05	-.01	.04	.07	-.01	.12	.59		-.03
20	.14	.08	-.03	.06	.04	.12	.04	.09	.03	.01	-.07	-.11	-.12	.03	-.15	-.11	-.14	.07	.04	

Table A-7

Rotated Factor Loadings for 17-Ketosteroid Study
Population = 85

Variable No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	9	h^2‡
01	17-Ketosteroid Output - Basal (P)*	.54	.13	.72	-.07	.06	.16	.15	-.06	-.01	.89
02	17-Ketosteroid Output - Pre Stress (P)	.41	.43	.10	-.19	-.03	.09	.06	.18	.16	.47
03	17-Ketosteroid Output - Stress (P)	.37	.39	.09	-.03	.05	.00	.08	-.04	.04	.31
04	17-Ketosteroid Output - Post Stress (P)	.50	.33	.35	.01	-.07	.09	-.18	-.07	.14	.55
05	17-Ketosteroid Output - Basal (T)**	.47	.01	.05	.72	.13	.02	.09	.01	-.04	.77
06	17-Ketosteroid Output - Pre Stress (T)	.42	.48	.16	-.08	-.04	.15	.14	.01	.00	.48
07	17-Ketosteroid Output - Stress (T)	.43	.46	-.02	.11	-.17	-.15	.12	.10	-.15	.51
08	17-Ketosteroid Output - Post Stress (T)	.47	.38	.05	-.11	.00	-.07	.10	-.16	.10	.43
09	Age (Years)	.15	-.01	.06	.10	-.39	.04	-.04	.01	.00	.19
10	Creatinine Output - Basal (P)	-.12	.06	-.19	.01	-.09	.28	-.19	.71	.11	.69
11	Creatinine Output - Pre Stress (P)	.08	-.07	.12	.01	-.02	.27	.71	-.17	.02	.63
12	Creatinine Output - Stress (P)	.11	-.09	.05	.08	.04	.32	.28	.52	.09	.49
13	Creatinine Output - Post Stress (P)	-.10	-.11	.19	.19	-.02	.30	.68	.20	.08	.69
14	Creatinine Output - Basal (T)	.08	-.05	-.07	-.11	-.01	.38	.12	.16	.17	.24
15	Creatinine Output - Pre Stress (T)	-.13	-.01	.10	-.10	.04	.53	.10	-.02	.41	.50
16	Creatinine Output - Stress (T)	-.17	.11	.09	-.02	.13	.49	.04	.13	.37	.46
17	Creatinine Output - Post Stress (T)	.13	.09	.03	.01	.07	.38	.37	.08	.21	.36
18	17-Ketosteroid Output (Milligrams per Hour)	.81	-.05	.40	.38	.05	.05	.15	.00	-.01	.99
19	Androgen Output (Milligrams per Hour)	.49	.10	.05	.19	.70	.04	.03	-.09	.07	.79
20	Total Testicular Volume	.18	-.05	.02	-.05	.00	-.02	-.13	-.03	-.09	.06

* P = Psychological Stress.

** T = Tank Stress.

‡ h^2 = Communality.

Summary of Factor Analysis*

The factors isolated by the analysis, as shown by the factor loadings in Table A-7, fall into three groups: ketosteroid, androgen, and creatinine factors.

Ketosteroid Factors

Factor 1 has moderately high and significant loadings on all measures of ketosteroid output (variables 01, 02, 03, 04, 05, 06, 07, 08, and 18) regardless of time or of the stressful situation involved. Accordingly this factor is considered to represent general ketosteroid production and has been labeled basic ketosteroid output. The highest loading (0.81) is found on variable 18, the average of the output for the two basal periods (variables 01 and 05). This indicates the higher reliability and validity of this composite measure as contrasted with any single measurement.

Of considerable physiological interest is the relatively high loading (0.49) of androgen output (variable 19) on this general ketosteroid factor, suggesting that the two are associated in some manner.

Ketosteroid output is unrelated to age within the limits (18-24) of this population,** or to total testicular volume in any significant manner, and none of the creatinine measures have significant projections on it.

Factor 2 has significant loadings on the pre-stress, stress, and post-stress samples of both situations and is considered to represent production of ketosteroid during stress. The loadings indicate that there are wide individual differences in such increase (the means for variables 02, 03, 04 and for 06, 07, 08 are higher than those for variables 01 and 05). For both situations, loadings are highest during the pre-stress period (0.43 for psychological and 0.48 for tank) and slightly lower (0.39 for psychological and 0.46 for tank) during stress itself.

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* For further details concerning these data see: Cook, E. B. and R. J. Wherry. The Urinary 17-Ketosteroid Output of Naval Submarine Enlisted Candidates During Two Stressful Situations. Human Biology, Vol. 22, No. 2, May 1950.

** Data for 85 of the 120 subjects.

The fact that all measures high on this factor also have significant loadings on the basic ketosteroid production factor indicates the necessity for using the normal ketosteroid excretion as a corrective measure in estimating stress output. This may be accomplished by reporting either (a) a direct difference, or (b) a ratio in effect, a difference of the logs.

The isolation of factor 2 supports the hypothesis which led to this study -- there is a fundamental mechanism operative during stress which results in a significant increase in 17-ketosteroid output, and the situations to which the subjects were exposed were sufficiently stressful to induce this hormonal response.

Factors 3 and 4 represent spurious overlap due to the duplicate reporting of results. Factor 3 is concerned with the overlap of variable 18 with variable 01, and factor 4 with the overlap of variables 18 and 05. Thus, the two factors merely indicate that variable 18 was obtained by averaging variables 01 and 05. Neither has any physiological significance.

Androgen Factor

Factor 5 has a significant positive loading (0.70) only on variable 19 (androgen mgm/hr) and is accordingly identified as an androgen production factor. The negative loading on age (0.39 for variable 09) clearly indicates a decrease of androgen output with age. Since the average age of the subjects in this study was only about 18.5 years (221.6 months) and the standard deviation only a little over 1 year (15.7 months), this negative correlation is considered definitely significant. Obviously, any such androgen measures should be corrected for age in some fashion. The factor seems of doubtful importance as a predictive device, but should prove interesting in comparison with masculinity measures from other areas of the total study.

Creatinine Factors

Factor 6 has significant positive loadings on all eight creatinine measures (variables 10 and 17) regardless of time or stress situation. It is therefore regarded as a general creatinine production factor. No other measures have significant projections on this factor; apparently creatinine production is unrelated to (a) ketosteroid production or (b) androgen production.

Factor 7 has significant loadings on the creatinine measure of both post-stress specimens as well as on the pre-stress and stress samples of the psychological situation. Loadings tend to be highest when the differences between two creatinine measures are smallest. This is indicated in Table A-8 which compares factor loadings and the differences in successive means.

Table A-8

Perseveration of Creatinine Production Indicated by Factor 7

Variable No.	Mean (gm)	Difference of Successive Means	Factor Loading
10	1.78		
11	1.80	0.02	0.71
12	2.02	0.22	0.28
13	2.05	0.03	0.68
14	1.46	0.59	0.12
15	1.79	0.33	0.10
16	2.00	0.21	0.04
17	1.99	0.01	0.37

Thus, factor 7 appears to measure the degree of constancy of creatinine in each specimen and accordingly it is labeled perseveration in creatinine production. It is regarded as some reaction common to the two post-stress periods, possibly associated with the delay in return of creatinine to normal levels after stress.

While the interpretation is not clear-cut, the emergence of this independent factor 7, in addition to the general creatinine production factor 6, holds promise for the detection of individual tolerance to stress as indicated by the differences in the degree of perseveration (resistance to change) of creatinine production.

Factor 8 has significant positive loadings on the creatinine measures of the basal and stress samples of the psychological stress situation, and a just barely significant loading (0.20) on the post-stress

sample of this situation. Factor 9 has significant loadings on the pre-stress, stress, and post-stress tank measurements. These two factors are considered specifics for the psychological (factor 8) and tank (factor 9) situations. They are probably best regarded as residual situational elements in the stress series after factors 6 and 7 are subtracted. Regarded thus, they appear to be of no further importance.

APPENDIX B

Blood Count Studies

Table B-30 Summary of Variables for Blood Count Study No. 5 With Their Means and Standard Deviations

Table B-31 Intercorrelations and Residuals of Variables from Blood Count Study No. 5

Table B-32 Rotated Factor Loadings of Blood Count Study No. 5

Table B-1

Individual Leucocyte Values (expressed in number of cells per cubic millimeter of blood)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	7575	7750	10950	10575	-	9325	-	11425
01	2*	9950	9125	8150	10450	-	9150	9175	12600
01	3*	9650	6750	6150	11175	-	-	-	-
01	4*	7825	7300	8475	9825	-	8300	9250	9825
01	5*	8400	11425	8825	9500	-	9275	8275	9650
01	6*	11900	10575	12175	12600	-	10800	12625	16050
02	1	10850	8325	12275	13125	-	7850	12075	11650
02	2	10825	9475	10775	9575	-	7950	10400	13850
02	3	7925	8700	8450	9300	-	11475	11775	8250
02	4	10900	6750	8250	8750	-	7000	9525	10425
02	5*	8675	9700	14875	13400	-	8550	12175	12325
02	6	10000	10250	11300	9875	-	7350	9825	6625
03	1	8500	8175	7650	8950	-	7525	8450	11875
03	2	8350	6900	7550	10725	-	5400	11800	10625
03	3	10675	8525	10475	10850	-	8175	14550	14675
03	4	9425	6325	11025	9700	-	6450	6900	8500
03	5	9825	8025	9300	13075	-	8400	11625	11725
03	6	9025	7500	9800	10025	-	7300	7550	9700
04	1	9425	6050	7600	7425	7925	8425	12300	13975
04	2	8725	8900	10075	10050	9275	7900	9125	8900
04	3	11075	10925	9925	9000	11650	8775	13900	11475
04	4*	8575	10875	7600	7350	9500	9775	9225	7625
04	5	6900	9475	9175	7325	7000	7850	9475	9975
04	6	10300	9550	8150	8475	8950	9425	12125	10375
05	1	8725	7775	5325	6725	8575	5150	9650	9000
05	2*	12975	9400	10625	9150	10000	9275	13775	19425
05	3*	9900	14025	10275	9075	-	-	-	-
05	4	9550	9025	9625	7825	10350	7725	10350	11850
05	5	10375	8650	8925	11125	9450	7575	13475	16000
05	6	17525	12625	10450	10200	9175	6625	12350	15000
06	1	10100	6225	8425	11100	6750	6475	6775	8200
06	2	11150	12850	13625	15250	14025	18500	15150	15650
06	3	12250	8350	8325	7350	9100	6950	8075	7350
06	4	13625	7825	12875	10475	9275	8025	9025	10600
06	5	8350	11400	9525	6975	9075	6550	10425	9775
06	6	8850	5700	10000	7500	8550	6525	7350	8850
07	1*	8475	6650	6275	12225	11800	5075	14250	16750
07	2*	6475	6650	6075	8275	6575	7025	9075	9150
07	3	6025	7300	6725	7175	5900	6550	7850	8750
07	4*	4450	6325	7950	5900	10400	5600	4475	6875
07	5	6275	6300	9950	8225	9675	7075	8825	8000
07	6	7050	5800	4950	7125	6625	6900	13400	8175
08	1	8725	7775	7225	7700	11125	8975	9750	10550
08	2	8525	11900	10700	11550	7525	11125	12800	11650
08	3	9225	6675	7575	8225	8450	7600	6725	8375
08	4	12775	8275	10725	9600	13075	16700	16370	16425
08	5*	12250	-	8875	8100	9925	8325	16950	11925
08	6*	8100	6575	8525	7050	6325	9025	10675	8550
09	1*	8250	8525	8300	9450	12525	7075	11775	9500
09	2	9900	9700	9850	11275	10700	8100	10825	8275
09	3*	8775	6925	6575	7625	7725	6275	9575	10525
09	4*	9150	5950	6700	6750	9550	7500	7175	7875
09	5	14600	11825	13400	15850	16150	11850	19875	16425
09	6*	9925	5525	7300	7025	7900	5225	8075	8275
10	1	9775	6625	9950	8150	11350	6100	9775	8750
10	2	10925	9175	10000	9675	7875	8325	12475	13750
10	3	6275	5050	4875	5525	6125	4025	5700	6275
10	4	6475	5150	6175	7000	5875	5250	7825	7000
10	5	7150	[illegible]	[illegible]	[illegible]				

10	1	9775	6625	9950	8150	11350	6100	9775	8750
10	2	10925	9175	10000	9675	7875	8325	12475	13750
10	3	6275	5050	4875	5525	6125	4025	5700	6275
10	4	6475	5150	6175	7000	5875	5250	7825	7000
10	5	7150	6700	6625	7550	4750	6400	7400	6325
10	6	8575	7175	11000	10225	8550	11925	12875	12350
11	1	10325	7250	7025	10425	6450	7150	7175	8325
11	2	9350	10225	9075	8425	10750	7600	7350	8275
11	3	9475	8525	11125	9950	9500	7925	10150	9200
11	4*	10300	11425	12850	12375	12350	11425	-	-
11	5	12225	7900	10800	7850	9550	8325	10325	11825
11	6	8125	4550	7025	5600	6675	6400	6350	7525
12	1	10875	11950	11750	10575	10225	8750	11225	16000
12	2*	10125	7925	9000	8500	9750	6675	8275	7400
12	3	11175	7200	10625	8150	11675	7325	10375	12100
12	4	10550	7950	8800	8025	8225	6400	7850	10750
12	5	10250	5350	8150	9050	7150	6175	6100	9125
12	6	7300	5925	8500	7725	8675	7700	10250	8150
13	1	9025	7800	9700	8725	8725	7725	9800	11950
13	2	9825	6800	8150	10100	9025	8200	12475	11075
13	3	7650	5625	12700	9050	7100	7075	9275	10075
13	4	8525	6025	9625	7725	5000	5425	7425	9325
13	5	7550	11250	16875	9350	8225	8850	10775	13450
13	6	17175	17550	19625	17600	11950	12075	12300	16300
14	1	13750	8600	11250	13000	12475	9175	9100	9125
14	2	8925	6000	10450	8875	9150	5175	6525	9550
14	3*	-	-	-	-	-	-	-	-
14	4	9275	7875	6175	10450	8725	4100	9150	7575
14	5*	9875	7575	8350	9800	11900	8175	7850	9025
14	6*	11500	9250	13075	-	13800	9825	14050	14725
15	1*	14225	13100	11425	9825	8875	9175	8275	8200
15	2	8100	8075	8650	7400	7475	7050	6625	10575
15	3	13125	8950	10025	8275	9300	5575	8300	12375
15	4	9625	7175	9175	7150	8900	6975	9325	9325
15	5	9375	7875	8475	6250	7575	10075	10525	12675
15	6	8300	6975	8650	7925	7525	6000	5150	6450
16	1	8825	7375	9250	7350	7050	6425	8300	9550
16	2	8900	5700	9175	6475	8125	6950	5250	8850
16	3*	9825	9875	10150	10425	8850	9375	8000	10125
16	4	11475	10775	11975	10375	7950	10725	6975	9825
16	5	8400	8000	11150	12450	9675	9100	12825	14325
16	6	7600	8100	8900	8700	9450	8950	8975	10450
17	1	7625	7725	7275	8475	11425	7000	7875	7800
17	2	12975	15475	14625	12100	11575	9100	12625	13000
17	3	7350	6875	6425	6500	7350	6775	5200	8000
17	4	6825	6875	6050	10175	8400	5725	7975	6800
17	5	11150	12000	17275	17375	15375	10350	14450	13300
17	6*	10525	8400	10700	12625	11925	6800	9825	12400
18	1*	8025	6525	-	6900	7525	8450	6775	8000
18	2*	-	-	-	-	-	-	-	-
18	3	7575	7275	10050	10425	10525	9500	12025	13350
18	4	9900	7950	7750	8475	7075	7975	11550	12650
18	5	7675	5225	7475	6750	5750	6250	9275	8225
18	6	9750	11150	11700	13050	10450	15325	19025	16600
19	1	10450	11750	9800	12775	13750	15100	9175	13475
19	2	9925	10100	11050	9000	9125	7475	10275	9200
19	3*	9075	9450	8525	9050	9000	8225	9050	9825
19	4*	-	-	-	-	-	-	-	-
19	5	7400	6600	7775	8925	9600	7225	10650	10725
19	6	7350	6575	7225	8675	7875	5625	7425	8525
20	1	9300	6800	9050	9825	12275	10000	10150	9525
20	2	11625	8825	12725	11525	11000	9675	9375	12375
20	3*	20600	14750	22875	17200	18900	25800	25125	22350
20	4	11150	8250	7875	7175	8675	8050	10625	10850
20	5	11275	10925	9300	9150	10075	8375	11100	11525
20	6	13675	8675	10125	9100	7450	8825	12350	19975

*** Subject not included in analysis.**
- Indicates no data.

Table B-2

Individual Polymorphonuclear Leucocyte Values (expressed in number of cells per cubic millimeter of blood)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	3712	4883	7446	6874	-	7274	-	8112
01	2*	4876	4836	4890	6479	-	5490	4955	7434
01	3*	4632	3173	3075	8046	-	-	-	-
01	4*	3287	3431	4577	5306	-	4482	5735	6386
01	5*	4956	8112	6707	6080	-	6122	5793	7045
01	6*	7259	7614	8644	9198	-	7344	9974	13643
02	1	5208	4745	7488	7350	-	4553	7970	7456
02	2	5629	6348	7327	6798	-	4929	7592	9557
02	3	3883	4959	4394	5115	-	9983	9067	6353
02	4	5341	3915	4538	5425	-	3710	6477	7089
02	5*	3644	5820	9520	8844	-	5130	8279	7888
02	6	4500	6150	6554	5826	-	3455	6288	3644
03	1	3740	4006	3596	4654	-	3612	4225	7363
03	2	3758	4002	4757	7615	-	3510	7434	7756
03	3	5338	5371	7123	6619	-	4333	10476	9979
03	4	5372	4175	7718	7275	-	3483	4278	6630
03	5	4618	4414	6045	8891	-	6384	7789	8677
03	6	5415	4575	5880	6115	-	4453	5210	6499
04	1	4995	3388	4788	4529	4359	5476	10455	11460
04	2	3577	5518	5138	5528	4081	4424	5110	4272
04	3	5981	8412	6451	5670	6408	5528	10147	7688
04	4*	2658	5438	2964	3087	4750	4497	3598	3660
04	5	3105	5306	5046	4102	3290	4946	6064	6284
04	6	3708	5348	4890	4492	4475	5278	8851	7678
05	1	4712	4199	3142	4439	3687	2884	5887	5040
05	2*	7655	6204	7013	6131	5300	6493	11571	17483
05	3*	6732	12202	8734	7623	-	-	-	-
05	4	5730	5415	6160	5243	5693	5330	7763	8532
05	5	5706	5450	6515	8233	5576	4166	9702	12960
05	6	15773	11110	8360	8058	5046	3246	9510	12450
06	1	4141	2677	4465	5661	2835	3238	3591	4756
06	2	6690	8738	10083	11133	10659	14245	12423	12520
06	3	6248	4259	4829	4043	4550	3892	4361	4263
06	4	8039	5165	9656	7333	5009	4735	5776	6890
06	5	4509	6270	6001	4604	5536	4061	6047	6061
06	6	4514	3135	7200	5250	4446	4241	4778	6372
07	1*	3983	3924	3765	8313	5074	2741	11685	13903
07	2*	3432	4323	3706	5462	3353	4356	5627	5856
07	3	3916	5037	4439	4449	3599	4454	5888	6913
07	4*	2225	2593	3816	2950	4576	2744	2551	3575
07	5	3514	3591	5473	5017	4547	4457	5030	5760
07	6	4089	3770	2871	4845	3843	4416	9246	5396
08	1	5497	5054	3757	4697	5896	5654	6728	6963
08	2	4518	6783	6634	7392	3612	6453	8064	7573
08	3	5904	4072	3863	4442	4310	4256	3632	4439
08	4	8304	5710	7400	6816	8891	12525	13264	11990
08	5*	9310	-	5414	5346	8139	6038	14069	9540
08	6*	5265	4011	4689	4583	3289	5866	7046	5643
09	1*	3713	4177	4399	6048	6764	4174	8125	6460
09	2	5247	5723	6107	7667	5564	4779	6928	5296
09	3*	6143	4432	4471	5490	5253	4204	7756	8631
09	4*	5033	2856	3283	3038	4966	3975	3659	4646
09	5	8176	7095	7638	11412	10013	7703	13714	10348
09	6*	5757	3260	3942	4777	4582	3187	5168	5213
10	1	5083	3909	5274	4238	6016	3416	7234	5950
10	2	6664	5689	5800	6192	5276	4995	10105	10725
10	3	4769	3182	2681	3205	3124	2174	3705	3514
10	4	3302	2627	3211	3780	3114	2625	4695	3990
10	5	4505	4958	4571	5285	2898	4032	5402	4554
10	6	4888	4162	7480	6442	4959	8109	9013	8522
11	1	6505	4133	4356	7506	3225	4433	4879	5828
11	2	5517	5828	4991	5308	5698	4408	4410	5793

10	1	5083	3909	5274	4238	6016	3416	7234	5950
10	2	6664	5689	5800	6192	5276	4995	10105	10725
10	3	4769	3182	2681	3205	3124	2174	3705	3514
10	4	3302	2627	3211	3780	3114	2625	4695	3990
10	5	4505	4958	4571	5285	2898	4032	5402	4554
10	6	4888	4162	7480	6442	4959	8109	9013	8522
11	1	6505	4133	4356	7506	3225	4433	4879	5828
11	2	5517	5828	4991	5308	5698	4408	4410	5793
11	3	4359	4263	5674	4378	4845	3725	4974	5060
11	4*	5356	6284	7325	7054	5928	6627	-	-
11	5	6235	4424	6588	4475	4680	4579	7331	9224
11	6	5038	2321	3513	3136	3204	2880	4001	4891
12	1	5220	6453	5993	5499	5010	4200	8531	12160
12	2*	5771	5231	5400	4930	6533	3872	5379	5180
12	3	5923	4104	5738	4890	7939	4542	8508	9801
12	4	7385	5486	5632	5618	5675	4544	5574	7203
12	5	5125	2515	4157	4797	3861	2655	2562	5293
12	6	2847	2903	3740	3863	3991	3696	6970	5216
13	1	6227	5148	6208	5933	5497	5408	7644	9560
13	2	6386	4624	5705	6363	5325	5576	10354	8639
13	3	4973	3544	8763	6064	3905	4387	6400	6750
13	4	5200	3133	5005	4172	2400	3309	5123	6061
13	5	4983	7988	10969	6358	5346	5841	8405	9684
13	6	12366	14040	15700	13200	8604	7970	10086	13366
14	1	8663	5848	6638	7280	6861	6514	5642	5293
14	2	5355	2880	4598	4793	5033	2795	3393	5062
14	3*	-	-	-	-	-	-	-	-
14	4	5380	4725	3458	6688	3926	2132	6222	4621
14	5*	6221	4166	4092	4998	4879	4415	4632	4693
14	6*	6440	5828	9545	-	7590	6878	9976	10602
15	1*	10100	9432	7998	6681	4970	6239	5296	5740
15	2	4536	4199	4585	4218	4037	3737	4571	6980
15	3	9056	6355	6115	5296	3906	2899	5312	8786
15	4	5968	4807	6147	4362	4895	4185	6994	6341
15	5	6188	5198	4746	3625	3712	7153	7789	9253
15	6	5976	4883	6315	5389	4365	4200	3451	4322
16	1	5383	4794	5828	4778	4160	3855	6059	6494
16	2	4183	2622	4312	3043	3738	3545	3098	5133
16	3*	6583	7505	6801	7715	5045	6281	5520	6885
16	4	6656	6250	7305	6536	4611	7186	4534	6681
16	5	4536	4800	6913	8342	5515	5551	9106	9598
16	6	4104	4941	4806	4959	5103	5818	5026	6166
17	1	3813	3708	3856	4831	6627	3430	4331	4914
17	2	6617	10678	9506	7623	6945	5733	8964	8970
17	3	4337	4400	3662	3120	4410	3523	2964	5200
17	4	3344	3850	3207	6105	4284	3378	4067	4080
17	5	6467	8760	13647	13379	10148	7349	10549	9709
17	6*	5999	4536	6848	7449	6678	3944	6681	8680
18	1*	5618	4437	-	5037	4590	5408	4878	5600
18	2*	-	-	-	-	-	-	-	-
18	3	4545	4729	6432	6359	5999	5795	10342	11214
18	4	5940	5486	4728	5255	4316	4945	10164	10753
18	5	3454	2769	3364	3915	2530	3063	5380	4606
18	6	6630	8586	8658	9788	6688	11647	15981	13612
19	1	5957	7050	6566	7793	7425	9211	6331	8759
19	2	5062	6767	6741	5310	4836	5382	5651	5244
19	3*	4084	5198	4518	4706	3780	4359	4616	5797
19	4*	-	-	-	-	-	-	-	-
19	5	4070	4026	4199	5087	5184	4552	8520	8151
19	6	3528	3419	4841	5205	3859	3319	4529	5541
20	1	5673	3808	5521	6583	8961	6800	7511	7049
20	2	6394	4854	6335	6800	6380	5225	6094	8910
20	3*	3914	3098	4575	3784	4158	5418	5779	4470
20	4*	6021	4785	4568	4664	4424	4830	6906	6293
20	5	6201	6337	5115	5216	5038	4690	6327	5878
20	6	10803	6506	7189	6006	4992	5825	10127	15980

* Subject not included in analysis.
- Indicates no data.

Table B-3

Individual Lymphocyte Values (expressed in number of cells per cubic millimeter of blood)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	3106	2170	2738	2855	-	1865	-	2514
01	2*	4179	3376	2527	3449	-	3020	3303	4410
01	3*	4439	3308	2645	2682	-	-	-	-
01	4*	3913	3504	3390	3832	-	3237	3053	3144
01	5*	2772	2971	1765	3040	-	2783	2317	2413
01	6*	3927	2327	2313	3150	-	2268	2146	2247
02	1	4883	3497	3928	4988	-	2983	3623	3845
02	2	4871	3032	2909	2681	-	2544	2600	3878
02	3	3487	3393	3549	3720	-	1262	2355	1320
02	4	4578	2363	2888	2538	-	2240	2477	2606
02	5*	4338	3738	4760	4288	-	2993	3774	4067
02	6	5000	4408	4181	3654	-	3234	3242	2518
03	1	4335	3434	3672	3759	-	3537	3634	4038
03	2	4008	2553	2416	2681	-	1728	4130	2444
03	3	4911	2643	3038	3689	-	3515	3492	3962
03	4	3770	2024	3087	2328	-	2774	2484	2550
03	5	4716	3130	2604	3923	-	2436	3371	2814
03	6	3159	2625	[illegible]	3308	-	2628	1963	2910
04	1	4147	2239	2584	2673	3091	2612	1722	2376
04	2	4624	3026	4332	3819	4638	3002	3559	4005
04	3	4541	2294	3077	2970	4777	3071	3197	3557
04	4*	4716	4133	3496	3234	3800	4399	4520	3355
04	5	3519	3790	3578	2784	3430	2591	3127	3392
04	6	5768	3534	2690	3390	3849	3770	2910	2386
05	1	3665	3421	1864	2152	4716	2009	3571	3690
05	2*	5060	2914	3400	2837	4200	2504	2066	1748
05	3*	2673	1403	1336	1271	-	-	-	-
05	4	3534	3339	2984	2348	3933	2163	2484	3081
05	5	4461	3028	2142	2781	3591	3106	3638	2720
05	6	1577	1515	1777	1938	3578	2783	2470	2400
06	1	5454	3113	3707	4773	3645	2914	2981	3116
06	2	4237	3855	3270	3965	2945	4070	2576	2974
06	3	5513	3591	3164	2940	4095	2711	3230	2793
06	4	4224	2269	2704	2724	3803	2809	2888	3498
06	5	3674	4674	3429	2232	3176	2424	3649	3226
06	6	3894	2394	2600	2100	3762	2219	2352	2301
07	1*	4153	2527	2259	3668	6490	2132	2423	2680
07	2*	2655	2128	2126	2483	3025	2459	3176	2928
07	3	1868	2044	2085	2583	1947	1834	1884	1750
07	4*	2003	3605	3816	2832	5616	[illegible]	1835	3025
07	5	2385	2520	4080	2961	4644	2476	3618	2000
07	6	2609	1856	1782	2138	2584	2139	3752	2207
08	1	2967	2488	3251	2849	4895	3052	2828	3376
08	2	3495	4522	3210	3350	3311	3783	4096	3495
08	3	2952	2336	3333	3619	3972	2964	2757	3601
08	4	3833	2234	3003	2400	3661	3507	2948	3778
08	5*	2573	-	3195	2673	3176	2415	2712	2266
08	6*	2511	2236	3410	2186	2720	2798	3416	2651
09	1*	4208	4092	3652	3213	5386	2547	3415	2945
09	2	4257	3589	3448	3157	4601	2997	3464	2814
09	3*	2369	2216	1973	1906	2395	1945	1724	1789
09	4*	3843	2797	3149	3510	4298	3225	3301	2993
09	5	5548	4139	5226	3804	5491	3674	5366	5420
09	6	4069	1989	3212	2108	3081	[illegible]	2746	2896
10	1	4497	2650	4478	3749	4994	2562	2542	2625
10	2	3496	2753	3300	2806	2126	2747	2121	2613
10	3	1318	1566	1853	2100	2756	1650	1938	2573
10	4	2914	2318	2779	3010	2526	2415	2974	2730
10	5	2288	1608	1789	1963	1520	2112	1924	1645
10	6	3259	2798	2860	3477	3335	3220	3605	3335
11	1	3407	2900	2389	2502	2967	2574	2081	2248
11	2	3553	3886	3721	2865	4515	2964	2720	2234

10	1	4497	2650	4478	3749	4774	[illegible]	[illegible]	[illegible]
10	2	3496	2753	3300	2806	2126	2747	2121	2613
10	3	1318	1566	1853	2100	2756	1650	1938	2573
10	4	2914	2318	2779	3010	2526	2415	2974	2730
10	5	2288	1608	1789	1963	1520	2112	1924	1645
10	6	3259	2798	2860	3477	3335	3220	3605	3335
11	1	3407	2900	2389	2502	2967	2574	2081	2248
11	2	3553	3886	3721	2865	4515	2964	2720	2234
11	3	4738	4007	4895	5174	4370	3963	4872	4048
11	4*	4635	4456	4883	4950	6052	4570	-	-
11	5	5746	3239	4104	3140	4680	3580	2788	2702
11	6	2925	1911	3091	2184	3137	3328	2159	2408
12	1	4785	4541	4935	4442	4601	3763	2582	3520
12	2*	4151	2378	3330	3315	3023	2470	2731	2072
12	3	5029	2952	4463	3097	3619	2637	1764	2299
12	4	2954	2226	2992	2167	2385	1728	2198	3333
12	5	4920	2729	3831	3982	3218	3273	3477	3924
12	6	4234	2903	4250	3785	4511	3927	3178	2853
13	1	2527	2496	3395	2618	3054	2086	2058	2271
13	2	3144	1904	2282	3232	3430	2460	1996	2326
13	3	2601	1969	3810	2987	3124	2547	2783	3123
13	4	3154	2772	4235	3167	2500	1953	2228	2984
13	5	2492	3150	5400	2899	2632	2921	2371	3497
13	6	4466	3335	3729	4048	2988	3985	2091	2608
14	1	4813	2494	4275	5460	5240	2569	3276	3741
14	2	3481	3000	5643	3994	3935	2277	3002	4202
14	3*	-	-	-	-	-	-	-	-
14	4	3617	2835	2594	3658	4537	1886	2837	2879
14	5*	3259	2879	3841	4214	6426	3188	3297	3791
14	6*	4830	3238	3400	-	5934	2751	3934	3976
15	1*	3841	3537	3199	3046	3550	2753	2896	2296
15	2	3321	3553	3720	2886	3364	3032	1921	3490
15	3	3938	2596	3709	2814	5115	2565	2905	3465
15	4	3369	2081	2661	2503	5916	2581	2145	2798
15	5	2906	2520	3475	2438	3712	2720	2526	3169
15	6	2241	1953	2249	2457	3085	1740	1545	2064
16	1	3177	2360	3053	2132	2468	2120	1992	2770
16	2	4450	2736	4404	3043	4063	3128	2048	3452
16	3*	2948	2173	3248	2606	3540	2906	2240	3038
16	4	4475	4202	4551	3424	3101	3218	2302	2948
16	5	3696	2880	4126	3984	3870	3367	3463	4584
16	6	3420	2997	3738	3480	4158	3043	3770	4180
17	1	3660	3785	3274	3475	4342	3430	3386	2730
17	2	6098	4488	4826	4356	4399	3094	3535	3900
17	3	2793	2269	2506	3055	2793	2981	2132	2480
17	4	3208	2819	2662	3765	3780	2176	3589	2448
17	5	4572	3120	3282	3823	4920	2898	3757	3458
17	6*	4315	3612	3531	5050	5009	2652	3046	3596
18	1*	2247	1892	-	1725	2784	2620	1694	2240
18	2*	-	-	-	-	-	-	-	-
18	3	2803	2255	3317	3545	4315	3420	1563	2003
18	4	3861	2306	2868	3051	2689	2871	1271	1898
18	5	4068	2351	4037	2768	3105	3125	3710	3537
18	6	2828	2119	2574	2741	3344	3218	2854	2822
19	1	4180	4348	3136	4727	6188	5738	2661	4447
19	2	4367	3030	3868	3240	3833	1944	4316	3680
19	3*	4628	3875	3666	4073	4860	3537	4073	3537
19	4*	-	-	-	-	-	-	-	-
19	5	'256	2442	3421	3570	4128	2601	2024	2574
19	6	3528	3025	2240	3210	3623	2081	2673	2728
20	1	3441	2788	3349	3046	3069	3000	2538	2477
20	2	4999	3707	5981	4495	4290	4064	3094	3218
20	3*	16686	11653	18300	13244	14553	20382	19095	17657
20	4	5018	3218	3150	2368	4077	3140	3506	4449
20	5	4961	4261	3999	3752	4735	3518	4551	5302
20	6	2872	2082	2835	3003	2310	2912	2100	3995

* Subject not included in analysis.
- Indicates no data.

Table B-4

Individual Monocyte Values (expressed in number of cells per cubic millimeter of blood)

Group No.	Subject No.	Psychological Stress Basal	Psychological Stress Pre Stress	Psychological Stress Stress	Psychological Stress Post Stress	Tank Stress Basal	Tank Stress Pre Stress	Tank Stress Stress	Tank Stress Post Stress
01	1*	379	155	110	423	-	47	-	343
01	2*	398	365	163	209	-	92	275	252
01	3*	386	68	246	224	-	-	-	-
01	4*	391	146	339	393	-	166	185	98
01	5*	336	229	177	95	-	186	83	80
01	6*	357	317	609	105	-	864	85	161
02	1	326	69	246	131	-	26	121	233
02	2	325	0	216	0	-	239	86	416
02	3	317	87	85	31	-	115	236	330
02	4	218	0	165	44	-	280	191	209
02	5*	174	49	123	134	-	342	101	247
02	6	83	51	113	33	-	294	32	199
03	1	255	409	77	358	-	62	254	119
03	2	167	207	227	215	-	108	118	106
03	3	214	341	210	217	-	41	291	73
03	4	94	127	110	65	-	65	138	170
03	5	197	241	372	65	-	28	349	59
03	6	181	150	490	301	-	49	227	194
04	1	94	242	76	74	238	84	123	0
04	2	87	29	202	201	186	158	46	178
04	3	222	109	199	180	233	73	278	77
04	4*	172	109	228	147	95	98	185	51
04	5	69	190	184	220	70	65	190	67
04	6	69	191	20	85	179	0	40	86
05	1	175	39	213	22	86	155	97	45
05	2*	130	78	106	76	200	93	0	97
05	3*	198	281	26	45	-	-	-	-
05	4	96	90	193	13	311	77	69	119
05	5	139	87	89	56	189	76	23	80
05	6	175	42	314	0	184	331	124	150
06	1	101	187	70	333	135	65	68	55
06	2	112	129	136	127	421	154	152	105
06	3	102	167	167	74	61	35	162	49
06	4	818	78	129	87	93	161	181	71
06	5	69	342	79	70	182	22	313	391
06	6	177	114	17	75	171	65	74	59
07	1*	254	45	126	122	59	102	24	168
07	2*	259	67	122	166	55	141	45	183
07	3	121	73	56	36	59	22	39	59
07	4*	134	52	159	19	18	18	45	138
07	5	188	52	199	82	194	142	29	160
07	6	141	48	99	71	66	138	67	245
08	1	175	78	48	39	37	74	0	53
08	2	85	60	107	38	50	111	22	58
08	3	185	67	227	41	42	152	135	168
08	4	128	83	89	48	262	167	136	110
08	5*	123	-	74	14	82	72	56	60
08	6*	81	66	85	12	63	90	18	86
09	1*	83	57	83	31	84	142	39	16
09	2	99	97	33	113	107	54	217	14
09	3*	73	57	44	25	25	21	64	18
09	4*	183	119	67	45	48	150	12	65
09	5	98	79	90	79	53	79	199	136
09	6*	33	111	12	58	66	52	81	83
10	1	32	0	83	27	227	31	0	73
10	2	219	92	200	80	39	83	0	275
10	3	52	25	98	9	20	27	10	63

10	1	32	0	83	27	227	31	0	13
10	2	219	92	200	80	39	83	0	275
10	3	52	25	98	9	20	27	10	63
10	4	21	52	20	0	59	9	13	58
10	5	12	22	133	0	95	128	0	127
10	6	57	48	220	0	71	60	86	124
11	1	0	60	12	70	21	0	24	0
11	2	16	102	15	70	72	0	24	41
11	3	0	85	0	67	64	26	102	0
11	4*	18	229	64	83	124	0	-	-
11	5	21	158	0	79	79	14	52	20
11	6	0	46	23	46	55	11	32	25
12	1	218	80	0	18	34	29	0	0
12	2*	0	79	60	14	27	11	0	13
12	3	56	24	18	14	20	0	0	0
12	4	18	40	44	26	27	0	0	0
12	5	17	27	41	15	36	62	0	16
12	6	24	59	0	13	0	0	34	27
13	1	0	13	0	58	29	13	0	20
13	2	98	22	27	68	0	14	41	74
13	3	13	10	0	0	48	12	0	50
13	4	28	0	64	52	0	9	0	77
13	5	0	0	0	0	82	44	0	135
13	6	0	58	33	0	0	81	41	28
14	1	0	43	19	0	21	16	0	16
14	2	0	10	18	0	16	17	22	16
14	3*	-	-	-	-	-	-	-	-
14	4	31	39	10	0	44	21	30	13
14	5*	33	0	0	0	39	14	0	15
14	6*	77	0	43	-	23	17	0	25
15	1*	0	43	38	0	59	0	0	0
15	2	14	0	0	13	0	12	0	0
15	3	0	0	0	0	47	0	14	0
15	4	16	12	0	0	15	0	0	0
15	5	16	0	42	0	0	0	0	0
15	6	14	23	0	0	38	0	9	0
16	1	0	0	0	12	12	0	0	0
16	2	0	10	30	0	27	12	0	0
16	3*	0	0	0	18	0	0	0	0
16	4	0	0	20	18	0	0	0	0
16	5	14	14	0	21	0	15	64	0
16	6	0	0	0	58	16	15	0	0
17	1	0	0	12	28	229	12	0	0
17	2	0	0	25	21	0	0	0	22
17	3	0	0	0	65	0	34	0	54
17	4	12	0	0	34	14	0	40	34
17	5	0	0	0	30	26	18	0	0
17	6*	0	0	0	0	0	0	0	21
18	1*	0	0	-	0	0	0	0	0
18	2*	-	-	-	-	-	-	-	-
18	3	0	0	17	18	0	16	13	23
18	4	0	0	0	0	0	0	0	0
18	5	0	0	0	0	0	0	31	0
18	6	17	19	0	22	0	0	0	0
19	1	34	39	0	0	0	0	0	0
19	2	0	0	0	0	0	0	0	0
19	3*	15	0	0	0	0	14	0	0
19	4*	-	-	-	-	-	-	-	-
19	5	13	0	0	29	0	0	0	0
19	6	12	0	12	0	13	0	13	0
20	1	0	0	0	0	0	0	0	0
20	2	0	0	0	20	0	0	0	41
20	3*	0	0	0	0	0	0	43	0
20	4*	0	0	0	0	15	0	0	0
20	5	38	0	15	15	0	0	18	19
20	6	0	0	0	0	0	0	0	34

* Subject not included in analysis.
- Indicates no data.

Table B-5

Individual Eosinophil Values (expressed in number of cells per cubic millimeter of blood)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	303	465	438	423	-	187	-	343
01	2*	398	365	489	209	-	458	551	504
01	3*	97	135	123	224	-	-	-	-
01	4*	235	219	254	197	-	332	185	197
01	5*	168	229	265	190	-	93	69	0
01	6*	357	317	244	126	-	324	85	0
02	1	434	69	368	263	-	157	242	233
02	2	54	190	216	96	-	318	86	93
02	3	159	261	254	279	-	20	98	68
02	4	872	608	660	700	-	700	476	417
02	5*	174	16	298	134	-	86	40	83
02	6	300	205	339	296	-	294	197	133
03	1	255	245	230	179	-	301	254	238
03	2	167	138	151	215	-	54	118	319
03	3	214	171	105	217	-	164	146	294
03	4	94	63	74	65	-	129	12	85
03	5	197	241	186	131	-	84	233	117
03	6	181	150	196	201	-	146	76	97
04	1	63	182	152	74	238	70	41	46
04	2	349	178	403	503	278	237	365	267
04	3	222	109	99	75	233	88	93	115
04	4*	1029	979	912	809	760	684	923	534
04	5	138	190	275	147	140	157	95	299
04	6	824	478	571	509	448	377	364	104
05	1	175	65	107	135	28	103	97	180
05	2*	130	188	88	92	100	55	45	64
05	3*	297	281	103	182	-	-	-	-
05	4	191	181	289	235	311	155	52	59
05	5	86	58	179	92	189	76	90	80
05	6	30	42	87	102	275	199	124	50
06	1	303	187	169	222	135	259	136	246
06	2	75	129	68	0	24	154	0	78
06	3	245	334	250	294	364	278	242	221
06	4	409	157	258	314	278	321	181	212
06	5	69	95	48	70	182	131	104	98
06	6	266	114	100	62	171	44	74	44
07	1*	85	67	126	122	59	51	47	28
07	2*	130	67	61	166	132	70	182	183
07	3	121	146	135	144	118	197	13	88
07	4*	89	42	159	49	208	112	45	138
07	5	126	126	199	82	290	23	177	66
07	6	141	116	149	71	199	207	268	245
08	1	175	78	145	77	223	180	98	106
08	2	426	357	749	809	527	668	384	466
08	3	92	134	152	165	42	152	135	168
08	4	383	248	215	288	131	501	82	329
08	5*	123	-	178	81	99	72	85	80
08	6*	243	197	256	282	190	181	214	86
09	1*	165	171	83	189	376	212	98	190
09	2	297	291	296	338	321	243	217	166
09	3*	88	208	44	153	77	126	79	35
09	4*	92	119	201	135	191	150	144	158
09	5	584	473	536	476	646	356	398	493
09	6*	50	111	73	70	158	105	67	69
10	1	98	66	67	82	76	61	0	44
10	2	656	642	600	484	79	333	125	92
10	3	126	253	195	166	184	121	57	63

10	1	98	66	67	82	76	61	0	44
10	2	656	642	600	484	79	333	125	92
10	3	126	253	195	166	184	121	57	63
10	4	194	155	124	210	118	158	78	210
10	5	286	134	133	302	190	128	61	63
10	6	343	215	330	307	171	358	258	371
11	1	413	218	141	313	194	215	215	250
11	2	281	307	91	169	430	228	221	248
11	3	379	171	223	299	190	159	203	184
11	4*	412	457	386	371	124	343	-	-
11	5	122	53	18	157	79	167	103	39
11	6	163	273	351	168	267	192	127	151
12	1	653	837	588	423	511	525	112	160
12	2*	203	159	180	170	195	267	166	148
12	3	112	144	319	82	97	73	52	0
12	4	211	159	88	241	165	128	79	215
12	5	103	54	82	181	72	124	61	91
12	6	219	59	255	77	87	77	85	82
13	1	271	156	97	87	175	232	98	120
13	2	197	272	163	404	181	164	41	74
13	3	51	47	127	61	71	59	46	101
13	4	171	121	289	309	100	109	74	187
13	5	76	113	338	94	82	73	36	23
13	6	172	146	163	352	359	100	82	109
14	1	275	258	338	260	250	92	182	274
14	2	74	60	209	89	183	52	131	191
14	3*	-	-	-	-	-	-	-	-
14	4	186	158	124	209	175	82	76	76
14	5*	395	530	418	686	357	572	314	451
14	6*	77	185	88	-	138	98	46	49
15	1*	285	88	229	98	178	92	74	82
15	2	243	162	346	296	75	212	133	212
15	3	131	74	201	166	186	56	56	124
15	4	193	215	275	286	267	209	187	187
15	5	188	158	254	188	152	202	211	127
15	6	83	58	72	40	50	40	103	65
16	1	265	221	185	441	212	450	249	287
16	2	267	285	367	324	244	209	105	266
16	3*	197	198	102	87	266	188	160	203
16	4	115	323	99	311	318	215	140	197
16	5	70	240	223	125	290	182	257	287
16	6	57	81	178	87	95	179	180	105
17	1	76	232	146	170	229	140	158	78
17	2	260	310	146	100	232	182	42	65
17	3	221	206	257	260	221	271	104	240
17	4	273	275	182	204	336	172	160	204
17	5	93	120	173	116	154	104	120	133
17	6*	211	252	321	253	239	340	82	124
18	1*	80	131	-	207	151	423	136	160
18	2*	-	-	-	-	-	-	-	-
18	3	152	218	201	521	316	190	67	23
18	4	66	159	78	254	71	80	20	0
18	5	154	105	75	135	115	125	186	55
18	6	195	446	351	392	418	460	381	166
19	1	209	235	98	256	114	[illegible]	92	404
19	2	199	303	221	360	274	150	308	276
19	3*	272	378	341	272	360	247	362	295
19	4*	-	-	-	-	-	-	-	-
19	5	148	66	233	89	288	72	53	18
19	6	221	132	145	174	315	225	149	256
20	1	186	204	181	197	123	200	68	31
20	2	233	265	382	231	330	194	281	248
20	3*	0	74	153	115	127	214	83	150
20	4	223	248	158	144	87	81	213	217
20	5	94	328	186	183	202	251	222	231
20	6	23	43	101	182	149	88	41	134

*Subject not included in analysis.

- Indicates no data.

Table B-6

Individual Basophil Values (expressed in number of cells per cubic millimeter of blood)

Group No.	Subject No.	Psychological Stress Basal	Pre Stress	Stress	Post Stress	Tank Stress Basal	Pre Stress	Stress	Post Stress
01	1*	51	26	36	88	-	47	-	77
01	2*	100	91	68	314	-	46	184	63
01	3*	48	34	0	19	-	-	-	-
01	4*	52	37	28	82	-	69	46	17
01	5*	84	0	29	16	-	0	27	0
01	6*	39	18	0	42	-	54	63	0
02	1	90	27	102	88	-	79	0	58
02	2	0	63	72	16	-	53	0	46
02	3	66	0	57	47	-	20	0	27
02	4	109	0	41	29	-	70	0	52
02	5*	87	0	0	23	-	28	0	21
02	6	75	34	0	66	-	74	17	66
03	1	43	27	51	15	-	13	14	20
03	2	14	12	13	35	-	9	0	18
03	3	35	14	52	18	-	0	48	25
03	4	31	11	36	32	-	21	0	66
03	5	0	54	0	0	-	28	78	59
03	6	15	13	81	50	-	24	13	32
04	1	47	0	25	13	13	28	0	0
04	2	15	29	0	17	0	0	0	0
04	3	37	0	66	0	117	44	46	0
04	4*	0	90	25	37	16	17	16	13
04	5	0	31	92	61	35	0	16	33
04	6	0	16	0	14	45	0	0	18
05	1	0	0	9	11	15	88	16	30
05	2*	22	0	18	0	50	20	23	0
05	3*	0	24	0	0	-	-	-	-
05	4	0	60	48	0	104	25	18	20
05	5	0	29	0	0	0	13	0	53
05	6	30	0	0	17	16	11		0
06	1	33	11	0	19	22	32	22	14
06	2	37	0	0	0	0	0	26	0
06	3	0	28	14	74	0	0	27	12
06	4	0	26	0	35	16	40	45	0
06	5	0	57	16	12	0	0	52	17
06	6	59	29	17	25	57	0	12	0
07	1*	42	11	11	0	30	17	0	0
07	2*	21	0	30	27	11	0	0	46
07	3	20	12	22	24	30	11	0	15
07	4*	15	0	14	0	18	10	8	0
07	5	11	0	17	14	32	0	0	14
07	6	35	10	16	12	11	23	0	55
08	1	15	13	24	0	75	15	32	71
08	2	0	20	72	0	13	56	64	20
08	3	16	11	0	0	21	76	67	28
08	4	42	0	35	80	43	28	28	329
08	5*	21	-	29	0	17	0	0	60
08	6*	27	11	14	12	63	30	35	15
09	1*	41	57	42	16	0	35	39	0
09	2	17	32	0	37	35	27	18	0
09	3*	29	23	22	0	0	0	0	0
09	4*	16	20	11	22	0	0	12	26
09	5	0	118	23	52	53	59	66	0
09	6*	0	37	12	23	0	0	14	0
10	1	0	0	17	0	0	10	0	29
10	2	0	30	50	48	39	83	41	45
10	3	0	17	49	9	51	20	0	42
10	4	21	17	31	12	10	17	26	58
10	5	36	0	33	0	16	21	0	0
10	6	43	0	74	17	15	60	22	41
11	1	0	0	0	18	43	12	36	0

10	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10	3	0	17	49	9	51	20	0	42
10	4	21	17	31	12	10	17	26	58
10	5	36	0	33	0	16	21	0	0
10	6	43	0	74	17	15	60	22	41
11	1	0	0	0	18	43	12	36	0
11	2	63	51	30	14	35	0	24	0
11	3	16	43	19	50	0	40	17	0
11	4*	0	19	64	62	21	0	-	-
11	5	40	26	0	0	16	0	0	0
11	6	14	0	58	28	22	0	21	0
12	1	18	60	39	18	0	29	19	0
12	2*	17	13	45	14	38	11	0	0
12	3	0	0	35	41	58	12	18	0
12	4	18	0	15	14	14	0	0	18
12	5	17	36	27	15	0	20	20	16
12	6	0	10	43	39	43	0	17	0
13	1	15	13	0	0	0	0	0	0
13	2	49	12	27	51	15	0	0	19
13	3	13	0	42	0	0	23	0	0
13	4	14	10	48	25	0	0	0	31
13	5	0	0	0	0	0	15	0	0
13	6	86	30	0	0	0	21	0	28
14	1	69	15	19	0	21	16	0	0
14	2	15	10	34	0	46	35	22	32
14	3*	-	-	-	-	-	-	-	-
14	4	31	0	10	0	15	7	0	13
14	5*	33	0	28	0	60	14	26	45
14	6*	20	16	22	-	0	17	0	25
15	1*	0	0	19	0	29	30	83	41
15	2	14	0	43	37	25	12	22	[illegible]
15	3	0	0	0	14	45	0	27	[illegible]
15	4	48	60	30	24	0	12	0	47
15	5	0	26	14	21	0	0	0	0
15	6	14	23	15	53	13	10	26	0
16	1	15	0	0	12	23	11	0	16
16	2	29	10	0	0	27	0	17	0
16	3*	66	0	0	34	15	16	14	33
16	4	20	36	0	52	0	18	12	0
16	5	28	14	0	21	0	0	0	0
16	6	[illegible]	0	29	87	16	0	30	0
17	1	0	0	0	14	38	12	26	0
17	2	0	0	25	21	0	15	0	0
17	3	0	34	11	0	12	12	9	0
17	4	23	12	20	0	14	19	0	0
17	5	0	0	29	57	0	18	25	0
17	6*	0	14	0	0	0	12	17	41
18	1*	14	33	-	0	13	0	12	0
18	2*	-	-	-	-	-	-	-	-
18	3	25	36	17	34	0	16	0	0
18	4	0	14	0	0	0	0	0	22
18	5	0	0	0	0	10	21	0	0
18	6	[illegible]	0	0	22	0	0	0	0
19	1	34	20	17	0	23	26	30	23
19	2	50	17	19	45	76	37	34	30
19	3*	0	16	0	15	15	27	0	17
19	4*	-	-	-	-	-	-	-	-
19	5	0	11	0	29	32	36	0	18
19	6	12	0	0	15	65	38	37	57
20	1	16	12	0	0	21	0	33	0
20	2	20	0	22	20	19	0	0	21
20	3*	0	0	0	0	127	0	83	0
20	4*	19	0	39	12	29	0	18	0
20	5	0	0	16	16	33	0	19	20
20	6	0	0	0	0	0	15	21	0

* Subject not included in analysis.
- Indicates no data.

Table B-7

Individual Polymorphonuclear Leucocyte Values (expressed as per cent of total leucocyte count)

Group No.	Subject No.	Psychological Stress: Basal	Psychological Stress: Pre Stress	Psychological Stress: Stress	Psychological Stress: Post Stress	Tank Stress: Basal	Tank Stress: Pre Stress	Tank Stress: Stress	Tank Stress: Post Stress
01	1*	49	63	68	65	-	78	-	71
01	2*	49	53	60	62	-	60	54	59
01	3*	48	47	50	72	-	-	-	-
01	4*	42	47	54	54	-	54	62	65
01	5*	59	71	76	64	-	66	70	73
01	6*	61	72	71	73	-	68	79	85
02	1	48	57	61	56	-	58	66	64
02	2	52	67	68	71	-	62	73	69
02	3	49	57	52	55	-	87	77	77
02	4	49	58	55	62	-	53	68	68
02	5*	42	60	64	66	-	60	68	64
02	6	45	60	58	59	-	47	64	55
03	1	44	49	47	52	-	48	50	62
03	2	45	58	63	71	-	65	63	73
03	3	50	63	68	61	-	53	72	68
03	4	57	66	70	75	-	54	62	78
03	5	47	55	65	68	-	76	67	74
03	6	60	61	60	61	-	61	69	67
04	1	53	56	63	61	55	65	85	82
04	2	41	62	51	55	44	56	56	48
04	3	54	77	65	63	55	63	73	67
04	4*	31	50	39	42	50	46	39	48
04	5	45	56	55	56	47	63	64	63
04	6	36	56	60	53	50	56	73	74
05	1	54	54	59	66	43	56	61	56
05	2*	59	66	66	67	53	70	84	90
05	3*	68	87	85	84	-	-	-	-
05	4	60	60	64	67	55	69	75	72
05	5	55	63	73	74	59	55	72	81
05	6	90	88	80	79	55	49	77	83
06	1	41	43	53	51	42	50	53	58
06	2	60	68	74	73	76	77	82	80
06	3	51	51	58	55	50	56	54	58
06	4	59	66	75	70	54	59	64	65
06	5	54	55	63	66	61	62	58	62
06	6	51	55	72	70	52	65	65	72
07	1*	47	59	60	68	43	54	82	83
07	2*	53	65	61	66	51	62	62	64
07	3	65	69	66	62	61	68	75	79
07	4*	50	41	48	50	44	49	57	52
07	5	56	57	55	61	47	63	57	72
07	6	58	65	58	68	58	64	69	66
08	1	63	65	52	61	53	63	69	66
08	2	53	57	62	64	48	58	63	65
08	3	64	61	51	54	51	56	54	53
08	4	65	69	69	71	68	75	81	73
08	5*	76	64	61	66	82	70	83	80
08	6*	[illegible]	[illegible]	[illegible]	65				
09	1*	45	49	53	64	54	59	69	68
09	2	53	59	62	68	52	59	64	64
09	3*	70	64	68	72	68	67	81	82
09	4*	55	48	49	45	52	53	51	59
09	5	56	60	57	72	62	65	69	63
09	6*	58	59	54	68	58	61	64	63
10	1	52	59	53	52	53	56	74	68
10	2	61	62	58	64	67	60	81	78
10	3	76	63	55	58	51	54	65	56

10	1	52	59	53	52	53	56	74	68
10	2	61	62	58	64	67	60	81	78
10	3	76	63	55	58	51	54	65	56
10	4	51	51	52	54	53	50	60	57
10	5	63	74	69	70	61	63	73	72
10	6	57	58	68	63	58	68	70	69
11	1	63	57	62	72	50	62	68	70
11	2	59	57	55	63	53	58	60	70
11	3	46	50	51	44	51	47	49	55
11	4*	52	55	57	57	48	58	-	-
11	5	51	56	61	57	49	55	71	78
11	6	62	51	50	56	48	45	63	65
12	1	48	54	51	52	49	48	76	76
12	2*	57	66	60	58	67	58	65	70
12	3	53	57	54	60	68	62	82	81
12	4	70	69	64	70	69	71	71	67
12	5	50	47	51	53	54	43	42	58
12	6	39	49	44	50	46	48	66	64
13	1	69	66	64	68	63	70	78	80
13	2	65	68	70	63	59	68	83	78
13	3	65	63	69	67	55	62	69	67
13	4	61	52	52	54	48	61	69	65
13	5	66	71	65	68	65	66	78	72
13	6	72	80	80	75	72	66	82	82
14	1	63	68	59	56	55	11	62	58
14	2	60	48	44	54	55	54	52	53
14	3*	-	-	-	-	-	-	-	-
14	4	58	60	56	64	45	52	68	61
14	5*	63	55	49	51	41	54	59	52
14	6*	56	63	73	68	55	70	71	72
15	1*	71	72	70	68	56	68	64	70
15	2	56	52	53	57	54	53	69	66
15	3	69	71	61	64	42	52	64	71
15	4	62	67	67	61	55	60	75	68
15	5	66	66	56	58	49	71	74	73
15	6	72	70	73	68	58	70	67	67
16	1	61	65	63	65	59	60	73	68
16	2	47	46	47	47	46	51	59	58
16	3*	67	76	67	74	57	67	69	68
16	4	58	58	61	63	58	67	65	68
16	5	54	60	62	67	57	61	71	67
16	6	54	61	54	57	54	65	56	59
17	1	50	48	53	57	58	49	55	63
17	2	51	69	65	63	60	63	71	69
17	3	59	64	57	48	60	52	57	65
17	4	49	56	53	60	51	59	51	60
17	5	58	73	79	77	66	71	73	73
17	6*	57	54	64	59	56	58	68	70
18	1*	70	68	65	73	61	64	72	70
18	2*	-	-	-	-	-	-	-	-
18	3	60	65	64	61	57	61	86	84
18	4	60	69	61	62	61	62	88	85
18	5	45	53	45	58	44	49	58	56
18	6	68	77	74	75	64	76	84	82
19	1	57	60	67	61	54	61	69	65
19	2	51	67	61	59	53	72	55	57
19	3*	45	55	53	52	42	53	51	59
19	4*	-	-	-	-	-	-	-	-
19	5	55	61	54	57	54	63	80	76
19	6	48	52	67	60	49	59	61	65
20	1	61	56	61	67	73	68	74	74
20	2	55	55	49	59	58	54	65	72
20	3*	19	21	20	22	22	21	23	20
20	4	54	58	58	65	51	60	65	58
20	5	55	58	55	57	50	56	57	51
20	6	79	75	71	66	67	66	82	80

*** Subject not included in analysis.**

- Indicates no data.

Table B-8

Individual Lymphocyte Values (expressed as per cent of total leucocyte count)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	41	28	25	27	-	20	-	22
01	2*	42	37	31	33	-	33	36	35
01	3*	46	49	43	24	-	-	-	-
01	4*	50	48	40	39	-	39	33	32
01	5*	33	26	20	32	-	30	28	25
01	6*	33	22	19	25	-	21	17	14
02	1	45	42	32	38	-	38	30	33
02	2	45	32	27	28	-	32	25	28
02	3	44	39	42	40	-	11	20	16
02	4	42	35	35	29	-	32	26	25
02	5*	50	39	32	32	-	35	31	33
02	6	50	43	37	37	-	44	33	38
03	1	51	42	48	42	-	47	43	34
03	2	48	37	32	25	-	32	35	23
03	3	46	31	29	34	-	43	24	27
03	4	40	32	28	24	-	43	36	30
03	5	48	39	28	30	-	29	29	24
03	6	35	35	32	33	-	36	26	30
04	1	44	37	34	36	39	31	14	17
04	2	53	34	43	38	50	38	39	45
04	3	41	21	31	33	41	35	23	31
04	4*	55	38	46	44	40	45	49	44
04	5	51	40	39	38	49	33	33	34
04	6	56	37	33	40	43	40	24	23
05	1	42	44	35	32	55	39	37	41
05	2*	39	31	32	31	42	27	15	9
05	3*	27	10	13	14	-	-	-	-
05	4	37	37	31	30	38	28	24	26
05	5	43	35	24	25	38	41	27	17
05	6	9	12	17	19	39	42	20	16
06	1	54	50	44	43	54	45	44	38
06	2	38	30	24	26	21	22	17	19
06	3	45	43	38	40	45	39	40	38
06	4	31	29	21	26	41	35	32	33
06	5	44	41	36	32	35	37	35	33
06	6	44	42	26	28	44	34	32	26
07	1*	49	38	36	30	55	42	17	16
07	2*	41	32	35	30	46	35	35	32
07	3	31	28	31	36	33	28	24	20
07	4*	45	57	48	48	54	49	41	44
07	5	38	40	41	36	48	35	41	25
07	6	37	32	36	30	39	31	28	27
08	1	34	32	45	37	44	34	29	32
08	2	41	38	30	29	44	34	32	30
08	3	32	35	44	44	47	39	41	43
08	4	30	27	28	25	28	21	18	23
08	5*	21	33	36	33	32	28	16	19
08	6*	31	34	40	31	43	31	32	31
09	1*	51	48	44	34	43	36	29	31
09	2	43	37	35	28	43	37	32	34
09	3*	27	32	30	25	31	31	18	17
09	4*	42	47	47	52	45	43	46	38
09	5	38	35	39	24	34	31	27	33
09	6*	41	36	44	30	39	38	34	35
10	1	46	40	45	46	44	42	26	30
10	2	32	30	33	29	27	33	17	19
10	3	21	31	38	38	45	41	34	41
10	4	45	45	45	43	43	46	38	39
10	5	32	21	27	26	32	33	26	26

10	2	32	30	33	29	27	33	17	19
10	3	21	31	38	38	45	41	34	41
10	4	45	45	45	43	43	46	38	39
10	5	32	24	27	26	32	33	26	26
10	6	38	39	26	34	39	27	28	27
11	1	33	40	34	24	46	36	29	27
11	2	38	38	41	34	42	39	37	27
11	3	50	47	44	52	46	50	48	44
11	4*	45	39	38	40	49	40	-	-
11	5	47	41	38	40	49	43	27	22
11	6	36	42	44	39	47	52	34	32
12	1	44	38	42	42	45	43	23	22
12	2*	41	30	37	39	31	37	33	28
12	3	45	41	42	38	31	36	17	19
12	4	28	28	34	27	29	27	28	31
12	5	48	51	47	44	45	53	57	43
12	6	58	49	50	49	52	51	31	35
13	1	28	32	35	30	35	27	21	19
13	2	32	28	28	32	38	30	16	21
13	3	34	35	30	33	44	36	30	31
13	4	37	46	44	41	50	36	30	32
13	5	33	28	32	31	32	33	22	26
13	6	26	19	19	23	25	33	17	16
14	1	35	29	38	42	42	28	36	41
14	2	39	50	54	45	43	44	46	44
14	3*	-	-	-	-	-	-	-	-
14	4	39	36	42	35	52	46	31	38
14	5*	33	38	46	43	54	39	42	42
14	6*	42	35	26	32	43	28	28	27
15	1*	27	27	28	31	40	30	35	28
15	2	41	44	43	39	45	43	29	33
15	3	30	29	37	34	55	46	35	28
15	4	35	29	29	35	44	37	23	30
15	5	31	32	41	39	49	27	24	25
15	6	27	28	26	31	41	29	30	32
16	1	36	32	33	29	35	33	24	29
16	2	50	48	48	47	50	45	39	39
16	3*	30	22	32	25	40	31	28	30
16	4	39	39	38	33	39	30	33	30
16	5	44	36	37	32	40	37	27	32
16	6	45	37	42	40	44	34	42	40
17	1	48	49	45	41	38	49	43	35
17	2	47	29	33	36	38	34	28	30
17	3	38	33	39	47	38	44	41	31
17	4	47	41	44	37	45	38	45	36
17	5	41	26	19	22	32	28	26	26
17	6*	41	43	33	40	42	39	31	29
18	1*	28	29	34	25	37	31	25	28
18	2*	-	-	-	-	-	-	-	-
18	3	37	31	33	34	41	36	13	15
18	4	39	29	37	36	38	36	11	15
18	5	53	45	54	41	54	50	40	43
18	6	29	19	22	21	32	21	15	17
19	1	40	37	32	37	45	38	29	33
19	2	44	30	35	36	42	26	42	40
19	3*	51	41	43	45	54	43	45	36
19	4*	-	-	-	-	-	-	-	-
19	5	44	37	44	40	43	36	19	24
19	6	48	46	31	37	46	37	36	32
20	1	37	41	37	31	25	30	25	26
20	2	43	42	47	39	39	42	33	26
20	3*	81	79	80	77	77	79	76	79
20	4	45	39	40	33	47	39	33	41
20	5	44	39	43	41	47	42	41	46
20	6	21	24	28	33	31	33	17	20

* Subject not included in analysis.
- Indicates no data.

Table B-9

Individual Monocyte Values (expressed as per cent of total leucocyte count)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	5.0	2.0	1.0	4.0	-	0.5	-	3.0
01	2*	4.0	4.0	2.0	2.0	-	1.0	3.0	2.0
01	3*	4.0	1.0	4.0	2.0	-	-	-	-
01	4*	5.0	2.0	4.0	4.0	-	2.0	2.0	1.0
01	5*	4.0	2.0	2.0	1.0	-	2.0	1.0	0.8
01	6*	3.0	3.0	5.0	0.8	-	8.0	0.7	1.0
02	1	3.0	0.8	2.0	1.0	-	0.3	1.0	2.0
02	2	3.0	0.0	2.0	0.0	-	3.0	0.8	3.0
02	3	4.0	1.0	1.0	0.3	-	1.0	2.0	4.0
02	4	2.0	0.0	2.0	0.5	-	4.0	2.0	2.0
02	5*	2.0	0.5	0.8	1.0	-	4.0	0.8	2.0
02	6	0.8	0.5	1.0	0.3	-	4.0	0.3	3.0
03	1	3.0	5.0	1.0	4.0	-	0.8	3.0	1.0
03	2	2.0	3.0	3.0	2.0	-	2.0	1.0	1.0
03	3	2.0	4.0	2.0	2.0	-	0.5	2.0	0.5
03	4	1.0	2.0	1.0	0.7	-	1.0	2.0	2.0
03	5	2.0	3.0	4.0	0.5	-	0.3	3.0	0.5
03	6	2.0	2.0	5.0	3.0	-	0.7	3.0	2.0
04	1	1.0	4.0	1.0	1.0	3.0	1.0	1.0	0.0
04	2	1.0	0.3	2.0	2.0	2.0	2.0	0.5	2.0
04	3	2.0	1.0	2.0	2.0	2.0	0.8	2.0	0.7
04	4*	2.0	1.0	3.0	2.0	1.0	1.0	2.0	0.7
04	5	1.0	2.0	2.0	3.0	1.0	0.8	2.0	0.7
04	6	0.7	2.0	0.3	1.0	2.0	0.0	0.3	0.8
05	1	2.0	0.5	4.0	0.3	1.0	3.0	1.0	0.5
05	2*	1.0	0.8	1.0	0.8	2.0	1.0	0.0	0.5
05	3*	2.0	2.0	0.3	0.5	-	-	-	-
05	4	1.0	1.0	2.0	0.2	3.0	1.0	0.7	1.0
05	5	1.0	1.0	1.0	0.5	2.0	1.0	0.2	0.5
05	6	1.0	0.3	3.0	0.0	2.0	5.0	1.0	1.0
06	1	1.0	3.0	0.8	3.0	2.0	1.0	1.0	0.7
06	2	1.0	1.0	1.0	0.8	3.0	0.8	1.0	0.7
06	3	0.8	2.0	2.0	1.0	0.7	0.5	2.0	0.7
06	4	6.0	1.0	1.0	0.8	1.0	2.0	2.0	0.7
06	5	0.8	3.0	0.8	1.0	2.0	0.3	3.0	4.0
06	6	2.0	2.0	0.2	1.0	2.0	1.0	1.0	0.7
07	1*	3.0	0.7	2.0	1.0	0.5	2.0	0.2	1.0
07	2*	4.0	1.0	2.0	2.0	0.8	2.0	0.5	2.0
07	3	2.0	1.0	0.8	0.5	1.0	0.3	0.5	0.7
07	4*	3.0	0.8	2.0	0.3	0.2	0.3	1.0	2.0
07	5	3.0	0.8	2.0	1.0	2.0	2.0	0.3	2.0
07	6	2.0	0.8	2.0	1.0	1.0	2.0	0.5	3.0
08	1	2.0	1.0	0.7	0.5	0.3	0.8	0.0	0.5
08	2	1.0	0.5	1.0	0.3	0.7	1.0	0.2	0.5
08	3	2.0	1.0	3.0	0.5	0.5	2.0	2.0	2.0
08	4	1.0	1.0	0.8	0.5	2.0	1.0	0.8	0.7
08	5*	1.0	0.5	0.8	0.2	0.8	0.8	0.3	0.5
08	6*	1.0	1.0	1.0	0.2	1.0	1.0	0.2	1.0
09	1*	1.0	0.7	1.0	0.3	0.7	2.0	0.3	0.2
09	2	1.0	1.0	0.3	1.0	1.0	0.7	2.0	0.2
09	3*	0.8	0.8	0.7	0.3	0.3	0.3	0.7	0.2
09	4*	2.0	2.0	1.0	0.7	0.5	2.0	0.2	0.8
09	5	0.7	0.7	0.7	0.5	0.3	0.7	1.0	0.8
09	6*	0.3	2.0	0.2	0.8	0.8	1.0	1.0	1.0
10	1	0.3	0.0	0.8	0.3	2.0	0.5	0.0	0.8
10	2	2.0	1.0	2.0	0.8	0.5	1.0	0.0	2.0
10	3	0.8	0.5	2.0	0.2	0.3	0.7	0.2	1.0
10	4	0.3	1.0	0.3	0.0	1.0	0.2	0.2	0.8
10	5	0.2	0.3	2.0	0.0	2.0	2.0	0.0	2.0
10	6	0.7	0.7	2.0	0.0	0.8	0.5	0.7	1.0
11	1	0.0	0.8	0.2	0.7	0.3	0.0	0.3	0.0
11	2	0.2	1.0	0.2	0.8	0.7	0.0	0.3	0.5

10	1	0.3	0.0	0.8	0.3	2.0	0.5	0.0	0.8
10	2	2.0	1.0	2.0	0.8	0.5	1.0	0.0	2.0
10	3	0.8	0.5	2.0	0.2	0.3	0.7	0.2	1.0
10	4	0.3	1.0	0.3	0.0	1.0	0.2	0.2	0.8
10	5	0.2	0.3	2.0	0.0	2.0	2.0	0.0	2.0
10	6	0.7	0.7	2.0	0.0	0.8	0.5	0.7	1.0
11	1	0.0	0.8	0.2	0.7	0.3	0.0	0.3	0.0
11	2	0.2	1.0	0.2	0.8	0.7	0.0	0.3	0.5
11	3	0.0	1.0	0.0	0.7	0.7	0.3	1.0	0.0
11	4*	0.2	2.0	0.5	0.7	1.0	0.0	-	-
11	5	0.2	2.0	0.0	1.0	0.8	0.2	0.5	0.2
11	6	0.0	1.0	0.3	0.8	0.8	0.2	0.5	0.3
12	1	2.0	0.7	0.0	0.2	0.3	0.3	0.0	0.0
12	2*	0.0	1.0	0.7	0.2	0.3	0.2	0.0	0.2
12	3	0.5	0.3	0.2	0.2	0.2	0.0	0.0	0.0
12	4	0.2	0.5	0.5	0.3	0.3	0.0	0.0	0.0
12	5	0.2	0.5	0.5	0.2	0.5	1.0	0.0	0.2
12	6	0.3	1.0	0.0	0.2	0.0	0.0	0.3	0.3
13	1	0.0	0.2	0.0	0.7	0.3	0.2	0.0	0.2
13	2	1.0	0.3	0.3	0.7	0.0	0.2	0.3	0.7
13	3	0.2	0.2	0.0	0.0	0.7	0.2	0.0	0.5
13	4	0.3	0.0	0.7	0.7	0.0	0.2	0.0	0.8
13	5	0.0	0.0	0.0	0.0	1.0	0.5	0.0	1.0
13	6	0.0	0.3	0.2	0.0	0.0	0.7	0.3	0.2
14	1	0.0	0.5	0.2	0.0	0.2	0.2	0.0	0.2
14	2	0.0	0.2	0.2	0.0	0.2	0.3	0.3	0.2
14	3*	-	-	-	-	-	-	-	-
14	4	0.3	0.5	0.2	0.0	0.5	0.5	0.3	0.2
14	5*	0.3	0.0	0.0	0.0	0.3	0.2	0.0	0.2
14	6*	0.7	0.0	0.3	0.2	0.2	0.2	0.0	0.2
15	1*	0.0	0.3	0.3	0.0	0.7	0.0	0.0	0.0
15	2	0.2	0.0	0.0	0.2	0.0	0.2	0.0	0.0
15	3	0.0	0.0	0.0	0.0	0.5	0.0	0.2	0.0
15	4	0.2	0.2	0.0	0.0	0.2	0.0	0.0	0.0
15	5	0.2	0.0	0.5	0.0	0.0	0.0	0.0	0.0
15	6	0.2	0.3	0.0	0.0	0.5	0.0	0.2	0.0
16	1	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0
16	2	0.0	0.2	0.3	0.0	0.3	0.2	0.0	0.0
16	3*	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
16	4	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0
16	5	0.2	0.2	0.0	0.2	0.0	0.2	0.5	0.0
16	6	0.0	0.0	0.0	0.7	0.2	0.2	0.0	0.0
17	1	0.0	0.0	0.2	0.3	2.0	0.2	0.0	0.0
17	2	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.2
17	3	0.0	0.0	0.0	1.0	0.0	0.5	0.0	0.7
17	4	0.2	0.0	0.0	0.3	0.2	0.0	0.5	0.5
17	5	0.0	0.0	0.0	0.2	0.2	0.2	0.0	0.0
17	6*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
18	1*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	2*	-	-	-	-	-	-	-	-
18	3	0.0	0.0	0.2	0.2	0.0	0.2	0.1	0.2
18	4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	5	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0
18	6	0.2	0.2	0.0	0.2	0.0	0.0	0.0	0.0
19	1	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
19	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	3*	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0
19	4*	-	-	-	-	-	-	-	-
19	5	0.2	0.0	0.0	0.3	0.0	0.0	0.0	0.0
19	6	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0
20	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.3
20	3*	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
20	4	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
20	5	-	-	-	-	-	-	-	-
20	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2

*Subject not included in analysis.
-Indicates no data.

Table B-10

Individual Eosinophil Values (expressed as per cent of total leucocyte count)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	4.0	6.0	4.0	4.0	-	2.0	-	3.0
01	2*	4.0	4.0	6.0	2.0	-	5.0	6.0	4.0
01	3*	1.0	2.0	2.0	2.0	-	-	-	-
01	4*	3.0	3.0	3.0	2.0	-	4.0	2.0	2.0
01	5*	2.0	2.0	3.0	2.0	-	1.0	0.8	0.0
01	6*	3.0	3.0	2.0	1.0	-	3.0	0.7	0.0
02	1	4.0	0.8	3.0	2.0	-	2.0	2.0	2.0
02	2	0.5	2.0	2.0	1.0	-	4.0	0.8	0.7
02	3	2.0	3.0	3.0	3.0	-	0.2	0.8	0.8
02	4	8.0	9.0	8.0	8.0	-	10.0	5.0	4.0
02	5*	2.0	0.2	2.0	1.0	-	1.0	0.3	0.7
02	6	3.0	2.0	3.0	3.0	-	4.0	2.0	2.0
03	1	3.0	3.0	3.0	2.0	-	4.0	3.0	2.0
03	2	2.0	2.0	2.0	2.0	-	1.0	1.0	3.0
03	3	2.0	2.0	1.0	2.0	-	2.0	1.0	2.0
03	4	1.0	1.0	0.7	0.7	-	2.0	0.2	1.0
03	5	2.0	3.0	2.0	1.0	-	1.0	2.0	1.0
03	6	2.0	2.0	2.0	2.0	-	2.0	1.0	1.0
04	1	0.7	3.0	2.0	1.0	3.0	0.8	0.3	0.3
04	2	4.0	2.0	4.0	5.0	3.0	3.0	4.0	3.0
04	3	2.0	1.0	1.0	0.8	2.0	1.0	0.7	1.0
04	4*	12.0	9.0	12.0	11.0	8.0	7.0	10.0	7.0
04	5	2.0	2.0	3.0	2.0	2.0	2.0	1.0	3.0
04	6	8.0	5.0	7.0	6.0	5.0	4.0	3.0	1.0
05	1	2.0	0.8	2.0	2.0	0.3	2.0	1.0	2.0
05	2*	1.0	2.0	0.8	1.0	1.0	0.6	0.3	0.3
05	3*	3.0	2.0	1.0	2.0	-	-	-	-
05	4	2.0	2.0	3.0	3.0	3.0	2.0	0.5	0.5
05	5	0.8	0.7	2.0	0.8	2.0	1.0	0.7	0.5
05	6	0.2	0.3	0.8	1.0	3.0	3.0	1.0	0.3
06	1	3.0	3.0	2.0	2.0	2.0	4.0	2.0	3.0
06	2	0.7	1.0	0.5	0.0	0.2	0.8	0.0	0.5
06	3	2.0	4.0	3.0	4.0	4.0	4.0	3.0	3.0
06	4	3.0	2.0	2.0	3.0	3.0	4.0	2.0	2.0
06	5	0.8	0.8	0.5	1.0	2.0	2.0	1.0	1.0
06	6	3.0	2.0	1.0	0.8	2.0	0.7	1.0	0.5
07	1*	1.0	1.0	2.0	1.0	0.5	1.0	0.3	0.2
07	2*	2.0	1.0	1.0	2.0	2.0	1.0	2.0	2.0
07	3	2.0	2.0	2.0	2.0	2.0	3.0	0.2	1.0
07	4*	2.0	0.7	2.0	0.8	2.0	2.0	1.0	2.0
07	5	2.0	2.0	2.0	1.0	3.0	0.3	2.0	0.8
07	6	2.0	2.0	3.0	1.0	3.0	3.0	2.0	3.0
08	1	2.0	1.0	2.0	1.0	2.0	2.0	1.0	1.0
08	2	5.0	3.0	7.0	7.0	7.0	6.0	3.0	4.0
08	3	1.0	2.0	2.0	2.0	0.5	2.0	2.0	2.0
08	4	3.0	3.0	2.0	3.0	1.0	3.0	0.5	2.0
08	5*	1.0	2.0	2.0	1.0	1.0	0.8	0.5	0.7
08	6*	3.0	3.0	3.0	4.0	3.0	2.0	2.0	1.0
09	1*	2.0	2.0	1.0	2.0	3.0	3.0	0.8	2.0
09	2	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
09	3*	1.0	3.0	0.7	2.0	1.0	2.0	0.8	0.3
09	4*	1.0	2.0	3.0	2.0	2.0	2.0	2.0	2.0
09	5	4.0	4.0	4.0	3.0	4.0	3.0	2.0	3.0
09	6*	0.5	2.0	1.0	1.0	2.0	2.0	0.8	0.8
10	1	1.0	1.0	0.7	1.0	0.7	1.0	0.0	0.5
10	2	6.0	7.0	6.0	5.0	1.0	4.0	1.0	0.7
10	3	2.0	5.0	4.0	3.0	3.0	3.0	1.0	1.0
10	4	3.0	3.0	2.0	3.0	2.0	3.0	1.0	3.0
10	5	4.0	2.0	2.0	4.0	4.0	2.0	0.8	1.0
10	6	4.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0
11	1	4.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
11	2	3.0	3.0	1.0	2.0	4.0	3.0	3.0	3.0

10	1	1.0	1.0	0.7	1.0	0.7	1.0	0.0	0.5
10	2	6.0	7.0	6.0	5.0	1.0	4.0	1.0	0.7
10	3	2.0	5.0	4.0	3.0	3.0	3.0	1.0	1.0
10	4	3.0	3.0	2.0	3.0	2.0	3.0	1.0	3.0
10	5	4.0	2.0	2.0	4.0	4.0	2.0	0.8	1.0
10	6	4.0	3.0	3.0	3.0	2.0	3.0	2.0	3.0
11	1	4.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
11	2	3.0	3.0	1.0	2.0	4.0	3.0	3.0	3.0
11	3	4.0	2.0	2.0	3.0	2.0	2.0	2.0	2.0
11	4*	4.0	4.0	3.0	3.0	1.0	3.0	-	-
11	5	1.0	0.7	0.2	2.0	0.8	2.0	1.0	0.3
11	6	2.0	6.0	5.0	3.0	4.0	3.0	2.0	2.0
12	1	6.0	7.0	5.0	4.0	5.0	6.0	1.0	1.0
12	2*	2.0	2.0	2.0	2.0	2.0	4.0	2.0	2.0
12	3	1.0	2.0	3.0	1.0	0.8	1.0	0.5	-
12	4	2.0	2.0	1.0	3.0	2.0	2.0	1.0	2.0
12	5	1.0	1.0	1.0	2.0	1.0	2.0	1.0	1.0
12	6	3.0	1.0	3.0	1.0	1.0	1.0	0.8	1.0
13	1	3.0	2.0	1.0	1.0	2.0	3.0	1.0	1.0
13	2	2.0	4.0	2.0	4.0	2.0	2.0	0.3	0.7
13	3	0.7	0.8	1.0	0.7	1.0	0.8	0.5	1.0
13	4	2.0	2.0	3.0	4.0	2.0	2.0	1.0	2.0
13	5	1.0	1.0	2.0	1.0	1.0	0.8	0.3	0.2
13	6	1.0	0.8	0.8	2.0	3.0	0.8	0.7	0.7
14	1	2.0	3.0	3.0	2.0	2.0	1.0	2.0	3.0
14	2	0.8	1.0	2.0	1.0	2.0	1.0	2.0	2.0
14	3*	-	-	-	-	-	-	-	-
14	4	2.0	2.0	2.0	2.0	2.0	2.0	0.8	1.0
14	5*	4.0	7.0	5.0	7.0	3.0	7.0	4.0	5.0
14	6*	0.7	2.0	0.7	0.5	1.0	1.0	0.3	0.3
15	1*	2.0	0.7	2.0	1.0	2.0	1.0	0.9	1.0
15	2	3.0	2.0	4.0	4.0	1.0	3.0	2.0	2.0
15	3	1.0	0.8	2.0	2.0	2.0	1.0	0.7	1.0
15	4	2.0	3.0	3.0	4.0	3.0	3.0	2.0	2.0
15	5	2.0	2.0	3.0	3.0	2.0	2.0	2.0	1.0
15	6	1.0	0.8	0.8	0.5	0.7	0.7	2.0	1.0
16	1	3.0	3.0	2.0	6.0	3.0	7.0	3.0	3.0
16	2	3.0	5.0	4.0	5.0	3.0	3.0	2.0	3.0
16	3*	2.0	2.0	1.0	0.8	3.0	2.0	2.0	2.0
16	4	1.0	3.0	0.8	3.0	4.0	2.0	2.0	2.0
16	5	0.8	3.0	2.0	1.0	3.0	2.0	2.0	2.0
16	6	0.8	1.0	2.0	1.0	1.0	2.0	2.0	1.0
17	1	1.0	3.0	2.0	2.0	2.0	2.0	2.0	1.0
17	2	2.0	2.0	1.0	0.8	2.0	2.0	0.3	0.5
17	3	3.0	3.0	4.0	4.0	3.0	4.0	2.0	3.0
17	4	4.0	4.0	3.0	2.0	4.0	3.0	2.0	3.0
17	5	0.8	1.0	1.0	0.7	1.0	1.0	0.8	1.0
17	6*	2.0	3.0	3.0	2.0	2.0	5.0	0.8	1.0
18	1*	1.0	2.0	2.0	3.0	2.0	5.0	2.0	2.0
18	2*	-	-	-	-	-	-	-	-
18	3	2.0	3.0	2.0	5.0	3.0	2.0	0.6	0.2
18	4	0.7	2.0	1.0	3.0	1.0	1.0	0.2	0.0
18	5	2.0	2.0	1.0	2.0	2.0	2.0	2.0	0.7
18	6	2.0	4.0	3.0	3.0	4.0	3.0	2.0	1.0
19	1	2.0	2.0	1.0	2.0	0.8	0.8	1.0	3.0
19	2	2.0	3.0	2.0	4.0	3.0	2.0	3.0	3.0
19	3*	3.0	4.0	4.0	3.0	4.0	3.0	4.0	3.0
19	4*	-	-	-	-	-	-	-	-
19	5	2.0	1.0	3.0	1.0	3.0	1.0	0.5	0.2
19	6	3.0	2.0	2.0	2.0	4.0	4.0	2.0	3.0
20	1	2.0	3.0	2.0	2.0	1.0	2.0	0.7	0.3
20	2	2.0	3.0	3.0	2.0	3.0	2.0	3.0	2.0
20	3*	0.0	0.5	0.7	0.7	0.7	0.8	0.3	0.7
20	4	2.0	3.0	2.0	2.0	1.0	1.0	2.0	2.0
20	5	0.8	3.0	2.0	2.0	2.0	3.0	2.0	2.0
20	6	0.2	0.5	1.0	2.0	2.0	1.0	0.3	0.7

*Subject not included in analysis.
-Indicates no data.

Table B-11

Individual Basophil Values (expressed as per cent of total leucocyte count)

Group No.	Subject No.	Psychological Stress				Tank Stress			
		Basal	Pre Stress	Stress	Post Stress	Basal	Pre Stress	Stress	Post Stress
01	1*	0.7	0.3	0.3	0.8	-	0.5	0.0	0.7
01	2*	1.0	1.0	0.8	3.0	-	0.5	2.0	0.5
01	3*	0.5	0.5	0.0	0.2	-	-	-	-
01	4*	0.7	0.5	0.3	0.8	-	0.8	0.5	0.2
01	5*	1.0	0.0	0.3	0.2	-	0.0	0.3	0.0
01	6*	0.3	0.2	0.0	0.3	-	0.5	0.5	0.0
02	1	0.8	0.3	0.8	0.7	-	1.0	0.0	0.5
02	2	0.0	0.7	0.7	0.2	-	0.7	0.0	0.3
02	3	0.8	0.0	0.7	0.5	-	0.2	0.0	0.3
02	4	1.0	0.0	0.5	0.3	-	1.0	0.0	0.5
02	5*	1.0	0.0	0.0	0.2	-	0.3	0.0	0.2
02	6	0.8	0.3	0.0	0.7	-	1.0	0.2	1.0
03	1	0.5	0.3	0.7	0.2	-	0.2	0.2	0.2
03	2	0.2	0.2	0.2	0.3	-	0.2	0.0	0.2
03	3	0.3	0.2	0.5	0.2	-	0.0	0.3	0.2
03	4	0.3	0.2	0.3	0.3	-	0.3	0.0	0.8
03	5	0.0	0.7	0.0	0.0	-	0.3	0.7	0.5
03	6	0.2	0.2	0.8	0.5	-	0.3	0.2	0.3
04	1	0.5	0.0	0.3	0.2	0.2	0.3	0.0	0.0
04	2	0.2	0.3	0.0	0.2	0.0	0.0	0.0	0.0
04	3	0.3	0.0	0.7	0.0	1.0	0.5	0.3	0.0
04	4*	0.0	0.8	0.3	0.5	0.2	0.2	0.2	0.2
04	5	0.0	0.3	1.0	0.8	0.5	0.0	0.2	0.3
04	6	0.0	0.2	0.0	0.2	0.5	0.0	0.0	0.2
05	1	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.3
05	2*	0.2	0.0	0.2	0.0	0.5	0.2	0.2	0.0
05	3*	0.0	0.2	0.0	0.0	-	-	-	-
05	4	0.0	0.7	0.5	0.0	1.0	0.3	0.2	0.2
05	5	0.0	0.3	0.0	0.0	0.0	0.2	0.0	0.3
05	6	0.2	0.0	0.0	0.2	0.2	0.2	0.0	0.0
06	1	0.3	0.2	0.0	0.2	0.3	0.5	0.3	0.2
06	2	0.3	0.0	0.0	0.0	0.0	0.0	0.2	0.0
06	3	0.0	0.3	0.2	1.0	0.0	0.0	0.3	0.2
06	4	0.0	0.3	0.0	0.3	0.2	0.5	0.5	0.0
06	5	0.0	0.5	0.2	0.2	0.0	0.0	0.5	0.2
06	6	0.7	0.5	0.2	0.3	0.7	0.0	0.2	0.0
07	1*	0.5	0.2	0.2	0.0	0.3	0.3	0.0	0.0
07	2*	0.3	0.0	0.5	0.3	0.2	0.0	0.0	0.5
07	3	0.3	0.2	0.3	0.3	0.5	0.2	0.0	0.2
07	4*	0.3	0.0	0.2	0.0	0.2	0.2	0.2	0.0
07	5	0.2	0.0	0.2	0.2	0.3	0.0	0.0	0.2
07	6	0.5	0.2	0.3	0.2	0.2	0.3	0.0	0.7
08	1	0.2	0.2	0.3	0.0	0.7	0.2	0.3	0.7
08	2	0.0	0.2	0.7	0.0	0.2	0.5	0.5	0.2
08	3	0.2	0.2	0.0	0.0	0.3	1.0	1.0	0.3
08	4	0.3	0.0	0.3	0.8	0.3	0.2	0.2	2.0
08	5*	0.2	0.2	0.3	0.0	0.2	0.0	0.0	0.5
08	6*	0.3	0.2	0.2	0.2	1.0	0.3	0.3	0.2
09	1*	0.5	0.7	0.5	0.2	0.0	0.5	0.3	0.0
09	2	0.2	0.3	0.0	0.3	0.3	0.3	0.2	0.0
09	3*	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
09	4*	0.2	0.3	0.2	0.3	0.0	0.0	0.2	0.3
09	5	0.0	1.0	0.2	0.3	0.3	0.5	0.3	0.0
09	6*	0.0	0.7	0.2	0.3	0.0	0.0	0.2	0.0
10	1	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.3
10	2	0.0	0.3	0.5	0.5	0.5	1.0	0.3	0.3
10	3	0.0	0.3	1.0	0.2	0.8	0.5	0.0	0.7
10	4	0.3	0.3	0.5	0.2	0.2	0.3	0.3	0.8
10	5	0.5	0.0	0.5	0.0	0.3	0.3	0.0	0.0
10	6	0.5	0.0	0.7	0.2	0.2	0.5	0.2	0.3
11	1	0.0	0.0	0.0	0.2	0.7	0.2	0.5	0.0
11	2	0.7	0.5	0.3	0.2	0.3	0.0	0.3	0.0

09	6*	0.0	0.7	0.2	0.3	0.0	0.0	0.2	0.0
10	1	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.3
10	2	0.0	0.3	0.5	0.5	0.5	1.0	0.3	0.3
10	3	0.0	0.3	1.0	0.2	0.8	0.5	0.0	0.7
10	4	0.3	0.3	0.5	0.2	0.2	0.3	0.3	0.8
10	5	0.5	0.0	0.5	0.0	0.3	0.3	0.0	0.0
10	6	0.5	0.0	0.7	0.2	0.2	0.5	0.2	0.3
11	1	0.0	0.0	0.0	0.2	0.7	0.2	0.5	0.0
11	2	0.7	0.5	0.3	0.2	0.3	0.0	0.3	0.0
11	3	0.2	0.5	0.2	0.5	0.0	0.5	0.2	0.0
11	4*	0.0	0.2	0.5	0.5	0.2	0.0	-	-
11	5	0.3	0.3	0.0	0.0	0.2	0.0	0.0	0.0
11	6	0.2	0.0	0.8	0.5	0.3	0.0	0.3	0.0
12	1	0.2	0.5	0.3	0.2	0.0	0.3	0.2	0.0
12	2*	0.2	0.2	0.5	0.2	0.4	0.2	0.0	0.0
12	3	0.0	0.0	0.3	0.5	0.5	0.2	0.2	0.0
12	4	0.2	0.0	0.2	0.2	0.2	0.0	0.0	0.2
12	5	0.2	0.7	0.3	0.2	0.0	0.3	0.3	0.2
12	6	0.0	0.2	0.5	0.5	0.5	0.0	0.2	0.0
13	1	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
13	2	0.5	0.2	0.3	0.5	0.2	0.0	0.0	0.2
13	3	0.2	0.0	0.3	0.0	0.0	0.3	0.0	0.0
13	4	0.2	0.2	0.5	0.3	0.0	0.0	0.0	0.3
13	5	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
13	6	0.5	0.2	0.0	0.0	0.0	0.2	0.0	0.2
14	1	0.5	0.2	0.2	0.0	0.2	0.2	0.0	0.0
14	2	0.2	0.2	0.3	0.0	0.5	0.7	0.3	0.3
14	3*	-	-	-	-	-	-	-	-
14	4	0.3	0.0	0.2	0.0	0.2	0.2	0.0	0.2
14	5*	0.3	0.0	0.3	0.0	0.5	0.2	0.3	0.5
14	6*	0.2	0.2	0.2	0.0	0.0	0.2	0.0	0.2
15	1*	0.0	0.0	0.2	0.0	0.3	0.3	1.0	0.5
15	2	0.2	0.0	0.5	0.5	0.3	0.2	0.3	0.0
15	3	0.0	0.0	0.0	0.2	0.3	0.0	0.3	0.0
15	4	0.5	0.8	0.3	0.3	0.0	0.2	0.0	0.5
15	5	0.0	0.3	0.2	0.3	0.0	0.0	0.0	0.0
15	6	0.2	0.3	0.2	0.7	0.2	0.2	0.5	0.0
16	1	0.2	0.0	0.0	0.2	0.3	0.2	0.0	0.2
16	2	0.3	0.2	0.0	0.0	0.3	0.0	0.3	0.0
16	3*	0.7	0.0	0.0	0.3	0.2	0.2	0.2	0.3
16	4	0.2	0.3	0.0	0.5	0.0	0.2	0.2	0.0
16	5	0.3	0.2	0.0	0.2	0.0	0.0	0.0	0.0
16	6	0.0	0.0	0.3	1.0	0.2	0.0	0.3	0.0
17	1	0.0	0.0	0.0	0.2	0.3	0.2	0.3	0.0
17	2	0.0	0.0	0.2	0.2	0.0	0.2	0.0	0.0
17	3	0.0	0.5	0.2	0.0	0.2	0.2	0.2	0.0
17	4	0.3	0.2	0.3	0.0	0.2	0.3	0.0	0.0
17	5	0.0	0.0	0.2	0.3	0.0	0.2	0.2	0.0
17	6*	0.0	0.2	0.0	0.0	0.0	0.2	0.2	0.3
18	1*	0.2	0.5	0.0	0.0	0.2	0.0	0.2	0.0
18	2*	-	-	-	-	-	-	-	-
18	3	0.3	0.5	0.2	0.3	0.0	0.2	0.0	0.0
18	4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2
18	5	0.0	0.0	0.0	0.0	0.2	0.3	0.0	0.0
18	6	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
19	1	0.3	0.2	0.2	0.0	0.2	0.2	0.3	0.2
19	2	0.5	0.2	0.2	0.5	0.8	0.5	0.3	0.3
19	3*	0.0	0.2	0.0	0.2	0.2	0.3	0.0	0.2
19	4*	-	-	-	-	-	-	-	-
19	5	0.0	0.2	0.0	0.3	0.3	0.5	0.0	0.2
19	6	0.2	0.0	0.0	0.2	0.8	0.7	0.5	0.7
20	1	0.2	0.2	0.0	0.0	0.2	0.0	0.3	0.0
20	2	0.2	0.0	0.2	0.2	0.2	0.0	0.0	0.2
20	3*	0.0	0.0	0.0	0.0	0.7	0.0	0.3	0.0
20	4	0.2	0.0	0.5	0.2	0.3	0.0	0.2	0.0
20	5	0.0	0.0	0.2	0.2	0.3	0.0	0.2	0.2
20	6	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0

* Subject not included in analysis.
- Indicates no data.

Table B-12

Summary of Total Leucocyte Ratios (expressed as a per cent of basal value)

Group No.	Subject No.	Psychological Stress: Pre Stress / Basal X 100	Psychological Stress: Stress / Basal X 100	Psychological Stress: Post Stress / Basal X 100	Tank Stress: Pre Stress / Basal** X 100	Tank Stress: Stress / Basal** X 100	Tank Stress: Post Stress / Basal** X 100
01	1*	102.3	144.6	139.6	123.1	-	150.8
01	2*	91.7	81.9	105.0	92.0	92.2	126.6
01	3*	69.9	63.7	115.8	-	-	-
01	4*	93.3	108.3	125.[illegible]	106.1	118.2	125.6
01	5*	136.0	105.1	113.1	110.4	98.5	114.9
01	6*	88.9	102.3	105.9	90.8	106.1	134.9
02	1	76.7	113.1	121.0	72.4	111.3	107.4
02	2	87.5	99.5	88.5	73.4	96.1	127.9
02	3	109.8	106.6	117.4	144.8	148.6	104.1
02	4	61.9	75.7	80.3	64.2	87.4	95.6
02	5*	111.8	171.5	154.5	98.6	140.3	142.1
02	6	102.5	113.0	98.8	73.5	98.3	66.3
03	1	96.2	90.0	105.3	88.5	99.4	139.7
03	2	82.6	90.4	128.4	64.6	141.3	127.2
03	3	79.9	98.1	101.6	76.6	136.3	137.5
03	4	67.1	117.0	102.9	68.4	73.2	90.2
03	5	81.7	94.7	133.1	85.5	118.3	119.3
03	6	83.1	108.6	111.1	80.9	83.7	107.5
04	1	64.2	80.6	78.8	106.3	155.2	176.3
04	2	102.0	115.5	115.2	85.2	98.4	96.0
04	3	98.6	89.6	81.3	75.3	119.3	98.5
04	4*	126.8	88.6	85.7	102.9	97.1	80.3
04	5	137.3	133.0	106.2	112.1	135.4	142.5
04	6	92.7	79.1	82.3	105.3	135.5	115.9
05	1	89.1	61.0	77.1	60.1	112.5	105.0
05	2*	72.4	81.9	70.5	92.8	137.8	194.3
05	3*	141.7	103.8	91.7	-	-	-
05	4	94.5	100.8	81.9	74.6	100.0	114.5
05	5	83.4	86.0	107.2	80.2	142.6	169.3
05	6	72.0	59.6	58.2	72.2	134.6	163.5
06	1	61.6	83.4	109.9	95.9	100.4	121.5
06	2	115.2	122.2	136.8	131.9	108.0	111.6
06	3	68.2	68.0	60.0	76.4	88.7	80.8
06	4	57.4	94.5	76.[illegible]	86.5	97.3	114.3
06	5	136.5	114.1	83.5	72.2	114.9	107.7
06	6	64.4	113.0	84.7	76.3	86.0	103.5
07	1*	78.5	74.0	144.2	43.0	120.8	141.9
07	2*	102.7	93.8	127.8	106.8	138.0	139.2
07	3	121.2	111.6	119.1	111.0	133.1	148.3
07	4*	142.1	178.7	132.6	53.8	430.3	66.1
07	5	100.4	158.6	131.1	73.1	91.2	82.7
07	6	82.3	70.2	101.1	104.2	202.3	123.4
08	1	89.1	82.8	88.3	80.7	87.6	94.8
08	2	139.6	125.5	135.5	147.8	170.1	154.8
08	3	72.4	82.1	89.2	89.9	79.6	99.1
08	4	64.8	84.0	75.1	127.7	125.2	125.6
08	5*	-	72.4	66.1	86.9	170.8	120.2
08	6*	81.2	105.2	87.0	142.7	168.8	135.2
09	1*	103.3	100.6	114.5	[illegible]6.5	94.0	75.8
09	2	98.0	99.5	113.9	[illegible].7	101.2	77.3
09	3*	78.9	74.9	86.9	81.2	123.9	136.2
09	4*	65.0	73.2	73.8	78.5	75.1	82.5
[illegible]	5	[illegible]	91.8	108.6	73.4	123.1	101.7
09	6*	55.7	73.6	70.8	66.1	102.2	104.7
10	1	67.8	101.8	83.4	53.7	86.1	77.1
10	2	84.0	91.5	88.6	105.7	158.4	174.6
10	3	80.5	77.7	88.0	65.7	93.1	102.4
10	4	79.5	95.4	108.1	89.4	133.2	119.1
10	5	93.7	92.7	105.6	134.7	155.8	133.2
10	6	83.7	128.3	119.2	139.5	150.6	144.4
11	1	70.2	68.0	101.0	110.9	111.2	129.1
11	2	109.4	97.1	90.1	70.7	68.4	77.0
11	3	90.0	117.4	105.0	83.4	106.8	96.8
11	4*	110.9	124.8	120.1	92.5	-	-
11	5	64.6	88.3	64.2	87.2	108.1	123.8
11	6	56.0	86.5	68.9	95.9	95.1	112.7
12	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

10	1	67.8	101.8	83.4	53.7	86.1	77.1
10	2	84.0	91.5	88.6	105.7	158.4	174.6
10	3	80.5	77.7	88.0	65.7	93.1	102.4
10	4	79.5	95.4	108.1	89.4	133.2	119.1
10	5	93.7	92.7	105.6	134.7	155.8	133.2
10	6	83.7	128.3	119.2	139.5	150.6	144.4
11	1	70.2	68.0	101.0	110.9	111.2	129.1
11	2	109.4	97.1	90.1	70.7	68.4	77.0
11	3	90.0	117.4	105.0	83.4	106.8	96.8
11	4*	110.9	124.8	120.1	92.5	-	-
11	5	64.6	88.3	64.2	87.2	108.1	123.8
11	6	56.0	86.5	68.9	95.9	95.1	112.7
12	1	109.9	108.0	97.2	85.6	109.8	156.5
12	2*	78.3	88.9	84.0	68.5	84.9	75.9
12	3	64.4	95.1	72.9	62.7	88.9	103.6
12	4	75.4	83 4	76.1	77.8	95.4	130.7
12	5	52.2	79.5	88.3	86.4	85.3	127.6
12	6	81.2	116.4	105.8	88.8	118.2	93.9
13	1	86.4	107.5	96.7	88.5	112.3	137.0
13	2	69.2	83.0	102.8	90.9	138.2	122.7
13	3	73.5	166.0	118.3	99.6	130.6	141 9
13	4	70.7	112.9	90.6	108.5	148.5	186.5
13	5	149.0	223.5	123.8	107.6	131.0	163.5
13	6	102.2	114.3	102.5	101.0	102.9	136.4
14	1	62.5	81.8	94.5	73.5	72.9	73.1
14	2	67.2	117.1	99.4	56.6	71.3	104.4
14	3*	-	-	-	-	-	-
14	4	84.9	66.6	112.7	47.0	104.9	86.8
14	5*	76.7	84.6	99.2	68.7	66.0	75.8
14	6*	80.4	113.7	-	71.2	101.8	106.7
15	1*	92.1	80.3	69.1	103.4	93.2	92.4
15	2	99.7	106.8	91.4	94.3	88.6	141.5
15	3	68.2	76.4	63.0	59.9	89.2	133.1
15	4	74.5	95.3	74.3	78.4	104.8	104.8
15	5	84.0	90.4	66.7	133.0	138.9	167.3
15	6	84.0	104.2	95.5	79.7	68.4	85.7
16	1	83.6	104.8	83.3	91.1	117.7	135.5
16	2	64.0	103.1	72.8	85.5	64.6	108.9
16	3*	100.5	103.3	106.1	105.9	90.4	114.4
16	4	93.9	104.4	90.4	134.9	87.7	123.6
16	5	95.2	132.7	148.2	94.1	132.6	148.1
16	6	106.6	117.1	114.5	94.7	95.0	110.6
17	1	101.3	95.4	111.1	61.3	68.9	68.3
17	2	119.3	112.7	93.3	78.6	109.1	112.3
17	3	93.5	87.4	88.4	92.2	70.7	108.8
17	4	100.7	88.6	149.1	68.2	94.9	81.0
17	5	107.6	154.9	155.8	67.3	94.0	86.5
17	6*	79.8	101.7	120.0	57.0	82.4	104.0
18	1*	81.3	-	86.0	112.3	90.0	106.3
18	2*	-	-	-	-	-	-
18	3	96.0	132.7	137.6	90.3	114.3	126.8
18	4	80.3	78.3	85.6	112.7	163.3	178.8
18	5	68.1	97.4	87.9	108.7	161.3	143.0
18	6	114.4	120.0	133.8	146.7	182.1	158.9
19	1	112.4	93.8	122.2	109.8	66.7	98.0
19	2	101.8	111.3	90.7	81.9	112.6	100.8
19	3*	104.1	93.9	99.7	91.4	100.6	109.2
19	4*	-	-	-	-	-	-
19	5	89.2	105.1	120.6	75.3	110.9	111.7
19	6	89.5	98.3	118.0	71.4	94.3	108.3
20	1	73.1	97.3	105.6	81.5	82.7	77.6
20	2	75.9	109.5	99.1	88.0	85.2	112.5
20	3*	71.6	111.0	83.5	136.5	132.9	118.3
20	4	74.0	70.6	64.3	92.8	122.5	125.1
20	5	96.9	82.5	81.2	83.1	110.2	114.4
20	6	63.4	74.0	66.5	118.5	165.8	268.1

* Subject not included in analysis.

** Use basal value #8 commencing with Group 04.

\- Indicates no data.

Table B-13

Summary of Polymorphonuclear Leucocyte Ratios (expressed as a per cent of basal value)

Group No.	Subject No.	Psychological Stress: Pre Stress / Basal X 100	Psychological Stress: Stress / Basal X 100	Psychological Stress: Post Stress / Basal X 100	Tank Stress: Pre Stress / Basal X 100	Tank Stress: Stress / Basal X 100	Tank Stress: Post Stress / Basal X 100
01	1*	131.5	200.6	185.2	196.0	-	218.5
01	2*	99.2	100.3	132.9	112.6	101.6	152.5
01	3*	68.5	66.4	173.7	-	-	-
01	4*	104.4	139.2	161.4	136.4	174.5	194.3
01	5*	163.7	135.3	122.7	123.5	116.9	142.2
01	6*	104.9	119.1	126.7	101.2	137.4	187.9
02	1	91.1	143.8	141.1	87.4	153.0	143.2
02	2	112.8	130.2	120.8	87.6	134.9	169.8
02	3	127.7	113.2	131.7	257.1	233.5	163.6
02	4	73.3	85.0	101.6	69.5	121.3	132.7
02	5*	159.7	261.3	242.7	140.8	227.2	216.5
02	6	136.7	145.6	129.5	76.8	139.7	81.0
03	1	107.1	96.1	124.4	96.6	113.0	196.9
03	2	106.5	126.6	202.6	93.4	197.8	206.4
03	3	100.6	133.4	124.0	81.2	196.3	186.9
03	4	77.7	143.7	135.4	64.8	79.6	123.4
03	5	95.6	130.9	192.5	138.2	168.7	187.9
03	6	84.5	108.6	112.9	82.2	96.2	120.0
04	1	67.8	95.9	90.7	125.6	239.8	262.9
04	2	154.3	143.6	154.5	108.4	125.2	104.7
04	3	140.6	107.9	94.8	86.3	158.3	120.0
04	4*	204.6	111.5	116.1	94.7	75.7	77.1
04	5	170.9	162.5	132.1	150.3	184.3	191.0
04	6	144.2	131.9	121.1	117.9	197.8	171.6
05	1	89.1	66.7	94.2	78.2	159.7	136.7
05	2*	81.0	91.6	80.1	122.5	218.3	329.9
05	3*	181.3	129.7	113.2	-		-
05	4	94.5	107.5	91.5	93.6	136.4	149.9
05	5	95.5	114.2	144.3	74.7	174.0	232.4
05	6	70.4	53.0	51.1	64.3	188.5	246.7
06	1	64.6	107.8	136.7	114.2	126.7	167.8
06	2	130.6	150.7	166.4	133.6	116.5	117.5
06	3	68.2	77.3	64.7	85.5	95.8	93.7
06	4	64.2	120.1	91.2	94.5	115.3	137.6
06	5	139.1	133.1	102.1	73.4	109.2	109.5
06	6	69.5	159.5	116.3	95.4	107.5	143.3
07	1*	98.5	94.5	208.7	54.0	230.3	274.0
07	2*	126.0	108.0	159.1	129.9	167.8	174.6
07	3	128.6	113.4	113.6	123.8	163.6	192.1
07	4*	116.5	171.5	132.6	60.0	55.7	78.1
07	5	102.2	155.7	142.8	98.0	110.6	126.7
07	6	92.2	70.2	118.5	114.9	240.6	140.4
08	1	91.9	68.3	85.4	95.9	114.1	118.1
08	2	150.1	146.8	163.6	178.7	223.3	209.7
08	3	69.0	65.4	75.2	98.7	84.3	103.0
08	4	68.8	89.1	82.1	140.9	149.2	134.9
08	5*	-	58.2	57.4	74.2	172.9	117.2
08	6*	76.2	89.1	87.0	178.4	214.2	171.6
09	1*	112.5	118.5	162.9	61.7	120.1	93.5
09	2	109.1	116.4	146.1	85.9	124.5	95.2
09	3*	72.1	72.8	89.4	80.0	147.6	164.3
09	4*	56.7	65.2	60.4	80.0	73.7	93.6
09	5	86.8	93.4	139.6	76.9	137.0	103.3
09	6*	56.6	68.5	83.0	69.6	112.8	113.8
10	1	76.9	103.8	83.4	5[illegible].8	120.2	98.9
10	2	86.4	87.0	92.9	94.7	191.5	203.3
10	3	66.7	56.2	67.2	69.6	118.6	112.5

10	1	76.9	103.8	83.4	56.8	120.2	98.9
10	2	86.4	87.0	92.9	94.7	191.5	203.3
10	3	66.7	56.2	67.2	69.6	118.6	112.5
10	4	79.6	97.2	114.5	84.3	150.8	128.1
10	5	110.1	101.5	117.3	139.1	186.4	157.1
10	6	85.1	153.0	131.8	163.5	181.8	171.8
11	1	63.5	67.0	115.4	137.5	151.3	180.7
11	2	105.6	90.5	96.2	77.4	77.4	101.7
11	3	97.8	130.2	100.4	76.9	102.7	104.4
11	4*	117.3	136.8	131.7	111.8	-	-
11	5	71.0	105.7	71.8	97.8	156.6	197.1
11	6	46.1	69.7	62.2	89.9	124.9	152.7
12	1	123.6	114.8	105.3	83.8	170.3	242.7
12	2*	90.6	93.6	85.4	59.3	82.3	79.3
12	3	69.3	96.9	82.6	57.2	107.2	123.5
12	4	74.3	76.3	76.1	80.1	98.2	126.9
12	5	49.1	81.1	93.6	68.8	66.4	137.1
12	6	102.0	131.4	135.7	92.6	174.6	130.7
13	1	82.7	99.7	95.3	98.4	139.1	173.9
13	2	72.4	89.3	99.6	104.7	194.4	162.2
13	3	71.3	176.2	121.9	112.3	163.9	172.9
13	4	60.3	96.3	80.2	137.9	213.5	252.5
13	5	160.3	220.1	127.6	109.3	157.2	181.1
13	6	113.5	127.0	106.7	92.6	117.2	155.3
14	1	67.5	76.6	84.0	94.9	82.2	77.1
14	2	53.8	85.9	89.5	55.5	67.4	100.6
14	3*	-	-	-	-	-	-
14	4	87.8	64.3	124.3	54.3	158.5	117.7
14	5*	67.0	65.8	80.3	90.5	94.9	96.2
14	6*	90.5	148.2	-	90.6	131.4	139.7
15	1*	93.4	79.2	66.1	125.5	106.6	115.5
15	2	92.6	101.1	93.0	92.6	113.2	172.9
15	3	70.2	67.5	58.5	74.2	136.0	224.9
15	4	80.5	103.0	73.1	85.5	142.9	129.5
15	5	84.0	76.7	58.6	192.7	209.8	249.3
15	6	81.7	105.7	90.2	96.2	79.1	99.0
16	1	89.1	108.3	88.8	92.7	145.6	156.1
16	2	62.7	103.1	72.7	94.8	82.9	137.3
16	3*	114.0	103.3	117.2	124.5	109.4	136.5
16	4	93.9	109.8	98.2	155.3	98.3	144.9
16	5	105.8	152.4	183.9	100.7	165.1	174.0
16	6	120.4	117.1	120.8	114.0	98.5	120.8
17	1	97.2	101.1	126.7	51.8	65.4	74.2
17	2	161.4	143.7	115.2	82.5	129.1	129.2
17	3	101.5	84.4	71.9	79.9	67.2	117.9
17	4	115.1	95.9	182.6	78.9	94.9	95.2
17	5	135.5	211.0	206.9	72.4	104.0	95.7
17	6*	75.6	114.2	124.2	59.1	100.0	130.0
18	1*	79.0	-	89.7	117.8	106.3	122.0
18	2*	-	-	-	-	-	-
18	3	104.0	141.5	139.9	96.6	172.4	186.9
18	4	92.4	79.6	88.5	114.6	235.5	249.1
18	5	80.2	97.4	113.3	121.1	212.6	182.1
18	6	129.5	130.6	147.6	174.1	239.0	203.5
19	1	118.3	110.2	130.8	124.1	85.3	118.0
19	2	133.7	133.2	104.9	111.3	116.9	108.4
19	3*	127.3	110.6	115.2	115.3	122.1	153.4
19	4*	-	-	-	-	-	-
19	5	98.9	103.2	125.0	87.8	164.4	157.2
19	6	96.9	137.2	147.5	86.0	117.4	143.6
20	1	67.1	97.3	116.0	75.9	83.8	78.7
20	2	75.9	99.1	106.3	81.9	95.5	139.7
20	3*	79.2	116.9	96.7	130.3	139.0	107.5
20	4	79.5	75.9	77.5	109.2	156.1	142.2
20	5	102.2	82.5	84.1	93.1	125.6	116.7
20	6	60.2	66.5	55.6	116.7	202.9	320.1

* Subject not included in analysis.
- Indicates no data.

Table B-14

Summary of Total Lymphocyte Ratios (expressed as a per cent of basal value)

Group No.	Subject No.	Psychological Stress: Pre Stress / Basal X 100	Psychological Stress: Stress / Basal X 100	Psychological Stress: Post Stress / Basal X 100	Tank Stress: Pre Stress / Basal X 100	Tank Stress: Stress / Basal X 100	Tank Stress: Post Stress / Basal X 100
01	1*	69.9	88.2	91.9	60.0	-	80.9
01	2*	80.8	60.5	82.5	72.3	79.0	105.5
01	3*	74.5	59.6	60.4	-	-	-
01	4*	89.5	86.6	97.9	82.7	78.0	80.3
01	5*	107.2	63.7	109.7	100.4	83.6	87.0
01	6*	59.3	58.9	80.2	57.8	54.6	57.2
02	1	71.6	80.4	102.2	61.1	74.2	78.7
02	2	62.2	59.7	55.0	52.2	53.4	79.6
02	3	97.3	101.8	106.7	36.2	67.5	37.9
02	4	51.6	63.1	55.4	48.9	54.1	56.9
02	5*	86.2	109.7	98.8	69.0	87.0	93.8
02	6	88.2	83.6	73.1	64.7	64.8	50.4
03	1	79.2	84.7	86.7	81.6	83.8	93.1
03	2	63.7	60.3	66.9	43.1	103.0	61.0
03	3	53.8	61.9	75.1	71.6	71.1	80.7
03	4	53.7	81.9	61.8	73.6	65.9	67.6
03	5	66.4	55.2	83.2	51.7	71.5	59.7
03	6	83.1	99.3	104.7	83.2	62.1	92.1
04	1	54.0	62.3	64.5	84.5	55.7	76.9
04	2	65.4	93.7	82.6	64.7	76.7	86.4
04	3	50.5	67.8	65.4	64.3	66.9	74.5
04	4*	87.6	74.1	68.6	115.8	118.9	88.3
04	5	107.7	101.7	79.1	75.5	91.2	98.9
04	6	61.3	46.6	58.8	97.9	75.6	62.0
05	1	93.3	50.9	58.7	42.6	75.7	78.2
05	2*	57.6	67.2	56.1	59.6	49.2	41.6
05	3*	52.5	50.0	47.5	-	-	-
05	4	94.5	84.4	66.4	55.0	63.2	78.3
05	5	67.9	48.0	62.3	86.5	101.3	75.7
05	6	96.1	112.7	122.9	77.8	69.0	67.1
06	1	57.1	68.0	87.5	79.9	81.8	85.5
06	2	91.0	77.2	93.6	138.2	87.5	101.0
06	3	65.1	57.4	53.3	66.2	78.9	68.2
06	4	53.7	64.0	64.5	73.9	75.9	92.0
06	5	127.2	93.3	60.8	76.3	114.9	101.6
06	6	61.5	66.8	53.9	59.0	62.5	61.2
07	1*	60.8	54.4	88.3	32.9	37.3	41.3
07	2*	80.2	80.1	93.5	81.3	105.0	96.8
07	3	109.4	111.6	138.3	94.2	96.8	89.9
07	4*	180.0	190.5	141.4	48.9	32.7	53.9
07	5	105.7	171.1	124.2	53.3	77.9	43.1
07	6	71.1	68.3	81.9	82.8	145.2	85.4
08	1	83.9	109.6	96.0	62.3	57.8	69.0
08	2	129.4	91.8	95.9	114.3	123.7	105.6
08	3	79.1	112.9	122.6	74.6	69.4	90.7
08	4	58.3	78.3	62.6	95.8	80.5	103.2
08	5*	-	124.2	103.9	76.0	85.4	71.3
08	6*	89.0	135.8	87.1	102.9	125.6	97.5
09	1*	97.2	86.8	76.4	47.3	63.4	54.7
09	2	84.3	81.0	74.2	65.1	75.3	61.2
09	3*	93.5	83.3	80.5	81.2	72.0	74.7
09	4*	72.8	81.9	91.3	75.0	76.8	69.6
09	5	74.6	94.2	68.6	66.9	97.7	98.7
09	6*	48.9	78.9	51.8	64.5	89.1	94.0
10	1	58.9	99.6	83.4	51.3	50.9	52.6
10	2	78.7	94.4	80.3	129.2	99.8	122.9
10	3	118.8	140.6	159.3	59.9	70.3	93.4
10	4	79.5	95.4	103.3	95.6	117.7	108.1
10	5	70.3	78.2	85.8	138.9	126.6	108.2
10	6	85.9	87.8	106.7	96.6	108.1	100.0

10	1	58.9	99.6	83.4	51.3	50.9	52.6
10	2	78.7	94.4	80.3	129.2	99.8	122.9
10	3	118.8	140.6	159.3	59.9	70.3	93.4
10	4	79.5	95.4	103.3	95.6	117.7	108.1
10	5	70.3	78.2	85.8	138.9	126.6	108.2
10	6	85.9	87.8	106.7	96.6	108.1	100.0
11	1	85.1	70.1	73.4	86.8	70.1	75.8
11	2	109.4	104.7	80.6	65.6	60.2	49.5
11	3	84.6	103.3	109.2	90.7	111.5	92.6
11	4*	96.1	105.4	106.8	75.5	-	-
11	5	56.4	71.4	54.6	76.5	59.6	57.7
11	6	65.3	105.7	74.7	106.1	68.8	76.8
12	1	94.9	103.1	92.8	81.8	56.1	76.5
12	2*	57.3	80.2	79.9	81.7	90.3	68.5
12	3	58.7	88.7	61.6	72.9	48.7	63.5
12	4	75.4	101.3	73.4	72.5	92.2	139.7
12	5	55.5	77.9	80.9	101.7	108.0	121.9
12	6	68.6	100.4	89.4	87.1	70.5	63.2
13	1	98.8	134.3	103.6	68.3	67.4	74.4
13	2	60.6	72.6	102.8	71.7	58.2	67.8
13	3	75.7	146.5	114.8	81.5	89.1	100.0
13	4	87.9	134.3	100.4	78.1	89.1	119.4
13	5	126.4	216.7	116.3	111.0	90.1	132.9
13	6	74.7	83.5	90.6	133.4	70.0	87.3
14	1	51.8	88.8	113.4	49.0	62.5	71.4
14	2	86.2	162.1	114.7	57.9	76.3	106.8
14	3*	-	-	-	-	-	-
14	4	78.4	71.7	101.1	41.6	62.5	63.5
14	5*	88.3	117.9	129.3	49.6	51.3	59.0
14	6*	67.0	70.4	-	46.4	66.3	67.0
15	1*	92.1	83.3	79.3	77.5	81.6	64.7
15	2	107.0	112.0	86.9	90.1	57.1	103.7
15	3	65.9	94.2	71.5	50.1	56.8	67.7
15	4	61.8	79.0	74.3	65.9	54.8	71.5
15	5	86.7	119.6	83.9	73.3	68.0	85.4
15	6	87.1	100.4	109.6	56.4	50.1	66.9
16	1	74.3	96.1	67.1	85.9	80.7	112.2
16	2	61.5	99.0	68 [illegible]	77.0	50.4	85.0
16	3*	73.7	110.2	88.4	82.1	63.3	85.8
16	4	93.9	101.7	76.5	103.8	74.2	95.1
16	5	77.9	111.6	107.8	87.0	89.5	118.4
16	6	87.6	109.3	101.8	73.2	90.7	100.5
17	1	103.4	89.5	94.9	79.0	78.0	62.9
17	2	73.6	79.1	71.4	70.3	80.4	88.7
17	3	81.2	89.7	109.4	106.7	76.3	88.8
17	4	67.9	83.0	117.4	57.6	94.9	64.8
17	5	68.2	71.8	83.6	58.9	76.4	70.3
17	6*	83.7	81.3	117.0	52.9	60.8	71.8
18	1*	84.2	-	76.8	94.1	60.8	80.5
18	2*	-	-	-	-	-	-
18	3	80.4	118.3	126.5	79.3	36.2	46.4
18	4	59.7	74.3	79.0	106.8	47.3	70.6
18	5	57.8	99.2	68.0	100.6	119.5	113.9
18	6	74.9	91.0	96.9	96.2	85.3	84.4
19	1	104.0	75.0	113.1	92.7	43.0	71.9
19	2	69.4	88.6	74.2	50.7	112.6	96.0
19	3*	83.7	79.2	88.0	72.8	83.8	72.8
19	4*	-	-	-	-	-	-
19	5	75.0	105.1	109.6	63.0	49.0	62.4
19	6	85.7	63.5	91.0	57.4	73.8	75.3
20	1	81.0	97.3	88.5	97.[illegible]	82.7	80.7
20	2	74.2	119.6	89.9	94.7	72.1	75.0
20	3*	69.8	109.7	79.4	140.1	131.2	121.3
20	4	64.1	62.8	47.2	77.0	86.0	109.1
20	5	85.9	80.6	75.6	74.3	90.1	112.0
20	6	72.5	98.7	104.6	126.1	90.9	172.9

*** Subject not included in analysis.**
- Indicates no data.

Table B-15

Summary of Monocyte Ratios (expressed as a per cent of basal value)

Group No.	Subject No.	Psychological Stress: Pre Stress / Basal X 100	Psychological Stress: Stress / Basal X 100	Psychological Stress: Post Stress / Basal X 100	Tank Stress: Pre Stress / Basal X 100	Tank Stress: Stress / Basal X 100	Tank Stress: Post Stress / Basal X.100
01	1*	40.9	29.0	111.6	12.4	-	90.5
01	2*	91.7	41.0	52.5	23.1	69.1	63.3
01	3*	17.6	63.7	58.0	-	-	-
01	4*	37.3	86.7	100.5	42.5	47.3	25.1
01	5*	68.2	52.7	28.3	55.4	24.7	23.8
01	6*	88.8	170.6	29.4	242.0	23.8	45.1
02	1	21.2	75.5	40.2	8.0	37.1	71.5
02	2	0.0	66.5	0.0	73.5	26.5	128.0
02	3	27.4	26.8	97.8	36.3	74.4	104.1
02	4	0.0	75.7	20.2	128.4	87.6	95.9
02	5*	28.2	70.7	77.0	196.6	58.0	142.0
02	6	61.4	136.1	39.8	354.2	38.6	239.8
03	1	160.4	30.2	140.4	24.3	99.6	46.7
03	2	124.0	135.9	128.7	64.7	70.7	63.5
03	3	159.3	98.1	101.4	19.2	136.0	34.1
03	4	135.1	117.0	69.1	69.1	146.8	180.9
03	5	122.3	188.8	33.0	14.2	177.2	29.9
03	6	82.9	270.7	166.3	27.1	125.4	107.2
04	1	257.4	80.9	78.7	35.3	51.7	0.0
04	2	33.3	232.2	231.0	84.9	24.7	95.7
04	3	49.1	89.6	81.1	31.3	119.3	33.0
04	4*	63.4	132.6	85.5	103.2	194.7	53.7
04	5	275.4	266.7	318.8	92.9	271.4	95.7
04	6	276.8	29.0	123.2	0.0	22.3	48.0
05	1	22.3	121.7	12.6	180.2	112.8	52.3
05	2*	60.0	81.5	58.5	46.5	0.0	48.5
05	3*	141.9	13.1	22.7	-	-	-
05	4	93.8	201.0	13.5	24.8	22.2	38.3
05	5	83.7	85.6	53.8	40.2	12.2	42.3
05	6	24.0	179.4	0.0	179.9	67.4	81.5
06	1	185.1	69.3	329.7	48.1	50.4	40.7
06	2	115.2	121.4	113.4	36.6	36.1	24.9
06	3	163.7	163.7	72.5	57.4	265.6	80.3
06	4	9.5	15.8	10.6	173.1	194.6	76.3
06	5	495.7	114.5	101.4	12.1	172.0	214.8
06	6	64.4	9.6	42.4	38.0	43.3	34.5
07	1*	17.7	49.6	48.0	172.9	40.7	284.7
07	2*	25.9	47.1	64.1	256.4	81.8	332.7
07	3	60.3	46.3	29.8	37.3	66.1	100.0
07	4*	38.8	118.7	14.2	100.0	250.0	766.7
07	5	27.7	105.9	43.6	73.2	14.9	82.5
07	6	34.0	70.2	50.4	209.1	101.5	371.2
08	1	44.6	27.4	22.3	200.0	0.0	143.2
08	2	70.6	125.9	44.7	222.0	44.0	116.0
08	3	36.2	122.7	22.2	361.9	321.4	400.0
08	4	64.8	69.5	37.5	63.7	51.9	42.0
08	5*	-	60.2	11.4	87.8	68.3	73.2
08	6*	81.5	104.9	14.8	142.9	28.6	136.5
09	1*	68.7	100.0	37.3	169.0	46.4	19.0
09	2	98.0	33.3	114.1	50.3	202.8	13.1
09	3*	78.1	60.3	34.2	84.7	256.0	72.0
09	4*	65.0	36.6	24.6	312.5	25.0	135.4
09	5	80.6	91.8	80.6	149.1	375.5	256.6
09	6*	336.4	36.4	175.8	78.8	122.7	125.8
10	1	0.0	259.4	84.4	13.7	0.0	32.2
10	2	42.0	91.3	36.5	212.8	0.0	705.1
10	3	48.1	188.5	17.3	135.0	50.0	315.0
10	4	247.6	95.2	0.0	15.3	22.0	98.3

10	1	0.0	259.4	84.4	13.7	0.0	32.2
10	2	42.0	91.3	36.5	212.8	0.0	705.1
10	3	48.1	188.5	17.3	135.0	50.0	315.0
10	4	247.6	95.2	0.0	15.3	22.0	98.3
10	5	183.3	1108.3	0.0	134.7	0.0	133.7
10	6	84.2	386.0	0.0	84.5	121.1	174.6
11	1	0.0	0.0	0.0	0.0	114.3	0.0
11	2	637.5	93.8	437.5	0.0	33.3	56.9
11	3	0.0	0.0	0.0	40.6	159.4	0.0
11	4*	1272.2	355.6	461.1	0.0	-	-
11	5	752.4	0.0	376.2	17.7	65.8	25.3
11	6	0.0	0.0	0.0	20.0	58.2	45.5
12	1	36.7	0.0	8.3	85.3	0.0	0.0
12	2*	0.0	0.0	0.0	40.7	0.0	48.1
12	3	42.9	32.1	25.0	0.0	0.0	0.0
12	4	222.2	244.4	144.4	0.0	0.0	0.0
12	5	158.8	241.2	88.2	172.2	0.0	44.4
12	6	245.8	0.0	54.2	0.0	0.0	0.0
13	1	0.0	0.0	0.0	44.8	0.0	69.0
13	2	22.4	27.6	69.4	0.0	0.0	0.0
13	3	76.9	0.0	0.0	25.0	0.0	104.2
13	4	0.0	228.6	185.7	0.0	0.0	0.0
13	5	0.0	0.0	0.0	53.7	0.0	164.6
13	6	0.0	0.0	0.0	0.0	0.0	0.0
14	1	0.0	0.0	0.0	76.2	0.0	76.2
14	2	0.0	0.0	0.0	106.3	137.5	100.0
14	3*	-	-	-	-	-	-
14	4	125.8	32.3	0.0	47.7	68.2	29.5
14	5*	0.0	0.0	0.0	35.9	0.0	38.5
14	6*	0.0	55.8	-	73.9	0.0	108.7
15	1*	0.0	0.0	0.0	0.0	0.0	0.0
15	2	0.0	0.0	92.9	0.0	0.0	0.0
15	3	0.0	0.0	0.0	0.0	29.8	0.0
15	4	75.0	0.0	0.0	0.0	0.0	0.0
15	5	0.0	262.5	0.0	0.0	0.0	0.0
15	6	164.3	0.0	0.0	0.0	23.7	0.0
16	1	0.0	0.0	0.0	0.0	0.0	0.0
16	2	0.0	0.0	0.0	44.4	0.0	0.0
16	3*	0.0	0.0	0.0	0.0	0.0	0.0
16	4	0.0	0.0	0.0	0.0	0.0	0.0
16	5	100.0	0.0	150.0	0.0	0.0	0.0
16	6	0.0	0.0	0.0	93.8	0.0	0.0
17	1	0.0	0.0	0.0	5.2	0.0	0.0
17	2	0.0	0.0	0.0	0.0	0.0	0.0
17	3	0.0	0.0	0.0	0.0	0.0	0.0
17	4	0.0	0.0	283.3	0.0	285.7	242.9
17	5	0.0	0.0	0.0	69.2	0.0	0.0
17	6*	0.0	0.0	0.0	0.0	0.0	0.0
18	1*	0.0	-	0.0	0.0	0.0	0.0
18	2*	-	-	-	-	-	-
18	3	0.0	0.0	0.0	0.0	0.0	0.0
18	4	0.0	0.0	0.0	0.0	0.0	0.0
18	5	0.0	0.0	0.0	0.0	0.0	0.0
18	6	111.8	0.0	129.4	0.0	0.0	0.0
19	1	114.7	0.0	0.0	0.0	0.0	0.0
19	2	0.0	0.0	0.0	0.0	0.0	0.0
19	3*	0.0	0.0	0.0	0.0	0.0	0.0
19	4*	-	-	-	-	-	-
19	5	0.0	0.0	223.1	0.0	0.0	0.0
19	6	0.0	100.0	0.0	0.0	100.0	0.0
20	1	0.0	0.0	0.0	0.0	0.0	0.0
20	2	0.0	0.0	0.0	0.0	0.0	0.0
20	3*	0.0	0.0	0.0	0.0	0.0	0.0
20	4	0.0	0.0	0.0	0.0	0.0	0.0
20	5	0.0	39.0	39.0	-	-	-
20	6	0.0	0.0	0.0	0.0	0.0	0.0

* Subject not included in analysis.
- Indicates no data.

Table B-16

Summary of Eosinophil Ratios (expressed as per cent of basal value)

Group No.	Subject No.	Psychological Stress: Pre Stress / Basal X 100	Psychological Stress: Stress / Basal X 100	Psychological Stress: Post Stress / Basal X 100	Tank Stress: Pre Stress / Basal X 100	Tank Stress: Stress / Basal X 100	Tank Stress: Post Stress / Basal X 100
01	1*	153.5	144.6	139.6	61.7	-	113.2
01	2*	91.7	122.9	52.5	115.1	138.4	126.6
01	3*	139.2	126.8	230.9	-	-	-
01	4*	93.2	108.1	83.8	141.3	78.7	83.8
01	5*	136.3	157.7	113.1	55.4	41.1	0.0
01	6*	88.8	68.3	35.3	90.8	238.1	0.0
02	1	15.9	84.8	60.6	36.2	55.8	53.7
02	2	351.9	400.0	177.8	588.9	159.3	172.2
02	3	164.2	159.7	175.5	12.6	61.6	42.8
02	4	69.7	75.7	80.3	80.3	54.6	47.8
02	5*	9.2	171.3	77.0	49.4	23.0	47.7
02	6	68.3	113.0	98.7	98.0	65.7	44.3
03	1	96.1	90.2	70.2	118.0	99.6	93.3
03	2	82.6	90.4	128.7	32.3	70.7	191.0
03	3	79.9	49.1	101.4	76.6	68.2	137.4
03	4	67.0	78.7	69.1	137.2	12.8	90.4
03	5	122.3	94.4	66.5	42.6	118.3	59.4
03	6	82.9	108.3	111.0	80.7	42.0	53.6
04	1	288.9	241.3	117.5	29.4	17.2	19.3
04	2	51.0	115.5	144.1	85.3	131.3	96.0
04	3	49.1	44.6	33.8	37.8	39.9	49.4
04	4*	95.1	88.6	78.6	90.0	121.4	70.3
04	5	137.7	199.3	106.5	112.1	67.9	213.6
04	6	58.0	69.3	61.8	84.2	81.3	23.2
05	1	37.1	61.1	77.1	367.9	346.4	642.9
05	2*	144.6	67.7	70.8	55.0	45.0	64.0
05	3*	94.6	34.7	61.3	-	-	-
05	4	94.8	151.3	123.0	49.8	16.7	19.0
05	5	67.4	208.1	107.0	40.2	47.6	42.3
05	6	140.0	290.0	340.0	72.4	45.1	18.2
06	1	61.7	55.8	73.3	191.9	100.7	182.2
06	2	172.0	90.7	0.0	64.2	0.0	325.0
06	3	136.3	102.0	120.0	76.4	66.5	60.7
06	4	38.4	63.1	76.8	115.5	65.1	76.3
06	5	137.7	69.6	101.4	72.0	57.1	53.8
06	6	42.9	37.6	23.3	25.7	43.3	25.7
07	1*	78.8	148.2	143.5	86.4	79.7	47.5
07	2*	51.5	46.9	127.7	53.0	137.9	138.6
07	3	120.7	111.6	119.0	166.9	11.0	74.6
07	4*	47.2	178.7	55.1	53.8	21.6	66.3
07	5	100.0	157.9	65.1	7.9	61.0	22.8
07	6	82.3	105.7	50.4	104.0	134.7	123.1
08	1	44.6	82.9	44.0	80.7	43.9	47.5
08	2	83.8	175.8	189.9	126.8	72.9	88.4
08	3	145.7	165.2	179.3	361.9	321.4	400.0
08	4	64.8	56.1	75.2	382.4	62.6	251.1
08	5*	-	144.7	65.9	72.7	85.9	80.8
08	6*	81.1	105.3	116.0	95.3	112.6	45.3
09	1*	103.6	50.3	114.5	56.4	26.1	50.5
09	2	98.0	99.7	113.8	75.7	67.6	51.7
09	3*	236.4	50.0	173.9	163.6	102.6	45.5
09	4*	129.3	218.5	146.7	78.5	75.4	82.7
09	5	81.0	91.8	81.5	55.1	61.6	76.3
09	6*	222.0	146.0	140.0	66.5	42.4	43.7
10	1	67.3	68.4	83.7	80.3	0.0	57.9
10	2	97.9	91.5	73.8	421.5	158.2	116.5
10	3	200.8	154.8	131.7	65.8	31.0	34.2
10	4	79.9	63.9	108.2	133.9	66.1	178.0
10	5	46.9	46.5	105.6	67.4	32.1	33.2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

10	1	67.3	68.4	83.7	80.3	0.0	57.9
10	2	97.9	91.5	73.8	421.5	158.2	116.5
10	3	200.8	154.8	131.7	65.8	31.0	34.2
10	4	79.9	63.9	108.2	133.9	66.1	178.0
10	5	46.9	46.5	105.6	67.4	32.1	33.2
10	6	62.7	96.2	89.5	209.4	150.9	217.0
11	1	52.8	34.1	75.8	110.8	110.8	128.9
11	2	109.3	32.4	60.1	53.0	51.4	57.7
11	3	45.1	58.8	78.9	83.7	106.8	96.8
11	4*	110.9	93.7	90.0	276.6	-	-
11	5	43.4	14.8	128.7	211.4	130.4	49.4
11	6	167.5	215.3	103.1	71.9	47.6	56.6
12	1	128.2	90.0	64.8	102.7	21.9	31.3
12	2*	78.3	88.7	83.7	136.9	85.1	75.9
12	3	128.6	284.8	73.2	75.3	53.6	0.0
12	4	75.4	41.7	114.2	77.6	47.9	130.3
12	5	52.4	79.6	175.7	172.2	84.7	126.4
12	6	26.9	116.4	35.2	88.5	97.7	94.3
13	1	57.6	35.8	32.1	132.6	56.0	68.6
13	2	138.1	82.7	205.1	90.6	22.7	40.9
13	3	92.2	249.0	119.6	83.1	64.8	142.3
13	4	70.8	169.0	180.7	109.0	74.0	187.0
13	5	148.7	444.7	123.7	89.0	43.9	28.0
13	6	84.9	94.8	204.7	27.9	22.8	30.4
14	1	93.8	122.9	94.5	36.8	72.8	109.6
14	2	81.1	282.4	120.3	28.4	71.6	104.4
14	3*	-	-	-	-	-	-
14	4	84.9	66.7	112.4	46.9	43.4	43.4
14	5*	134.2	105.8	173.7	160.2	88.0	126.3
14	6*	240.3	114.3	-	71.0	33.3	35.5
15	1*	30.9	80.4	34.4	51.7	41.6	46.1
15	2	66.6	142.4	121.8	282.7	177.3	282.7
15	3	56.5	153.4	126.7	30.1	30.1	66.7
15	4	111.4	142.5	148.2	78.3	70.0	70.0
15	5	84.0	135.1	100.0	132.9	138.8	83.6
15	6	69.9	86.7	48.2	80.0	206.0	130.0
16	1	83.4	69.8	166.4	212.3	117.5	135.4
16	2	106.7	137.5	121.3	85.7	43.0	109.0
16	3*	100.5	51.8	44.2	70.7	60.2	76.3
16	4	280.9	86.1	270.4	67.6	44.0	61.9
16	5	342.9	318.6	178.6	62.8	88.6	99.0
16	6	142.1	312.3	152.6	188.4	189.5	110.5
17	1	305.3	192.1	223.7	61.1	69.0	34.1
17	2	119.2	56.2	38.5	78.4	18.1	28.0
17	3	93.2	116.3	117.6	122.6	47.1	108.6
17	4	100.7	66.7	74.7	51.2	47.6	60.7
17	5	129.0	186.0	124.7	67.5	77.9	86.4
17	6*	119.4	152.1	119.9	142.3	34.3	51.9
18	1*	163.8	-	258.8	280.1	90.1	106.0
18	2*	-	-	-	-	-	-
18	3	143.4	132.2	342.8	60.1	21.2	72.8
18	4	240.9	118.2	384.8	112.7	28.2	0.0
18	5	68.2	48.7	87.7	108.7	161.7	47.8
18	6	228.7	180.0	201.0	110.0	91.1	39.7
19	1	112.4	46.9	122.5	109.6	80.7	354.4
19	2	152.3	111.1	180.9	54.7	112.4	100.7
19	3*	139.0	125.4	100.0	68.6	100.6	81.9
19	4*	-	-	-	-	-	-
19	5	44.6	157.4	60.1	25.0	18.4	6.3
19	6	59.7	65.6	78.7	71.4	47.3	81.3
20	1	109.7	97.3	105.9	162.6	55.3	25.2
20	2	113.7	163.9	99.1	58.8	85.2	75.2
20	3*	0.0	0.0	0.0	168.5	65.4	118.1
20	4	111.2	70.9	64.6	93.1	244.8	249.4
20	5	348.9	197.9	194.7	124.3	109.9	114.4
20	6	187.0	439.1	791.3	59.1	27.5	89.9

* Subject not included in analysis.
\- Indicates no data.

Table B-17

Summary of Basophil Ratios (expressed as a per cent of basal value)

Group No.	Subject No.	Psychological Stress: Pre Stress / Basal X 100	Psychological Stress: Stress / Basal X 100	Psychological Stress: Post Stress / Basal X 100	Tank Stress: Pre Stress / Basal X 100	Tank Stress: Stress / Basal X 100	Tank Stress: Post Stress / Basal X 100
01	1*	51.0	70.6	172.5	92.2	-	151.0
01	2*	91.0	68.0	314.0	46.0	184.0	63.0
01	3*	70.8	0.0	39.6	-	-	-
01	4*	71.2	53.8	157.7	132.7	88.5	32.7
01	5*	0.0	34.5	19.0	0.0	32.1	0.0
01	6*	46.2	0.0	107.7	138.5	161.5	0.0
02	1	30.0	113.3	97.8	87.8	0.0	64.4
02	2	0.0	0.0	0.0	0.0	0.0	0.0
02	3	0.0	86.4	71.2	30.3	0.0	40.9
02	4	0.0	37.6	26.6	64.2	0.0	47.7
02	5*	0.0	0.0	26.4	32.2	0.0	24.1
02	6	45.3	0.0	88.0	98.7	22.7	88.0
03	1	62.8	118.6	34.9	30.2	32.6	46.5
03	2	85.7	92.9	250.0	64.3	0.0	128.6
03	3	40.0	148.6	51.4	0.0	137.1	71.4
03	4	35.5	116.1	103.2	67.7	0.0	212.9
03	5	0.0	0.0	0.0	0.0	0.0	0.0
03	6	86.7	54.0	333.3	160.0	86.7	213.3
04	1	0.0	53.2	27.7	215.4	0.0	0.0
04	2	193.3	0.0	113.3	0.0	0.0	0.0
04	3	0.0	178.4	0.0	37.6	39.3	0.0
04	4*	0.0	0.0	0.0	106.3	100.0	81.3
04	5	0.0	0.0	0.0	0.0	45.7	94.3
04	6	0.0	0.0	0.0	0.0	0.0	40.0
05	1	0.0	0.0	0.0	58.7	106.7	200.0
05	2*	0.0	81.8	0.0	40.0	46.0	0.0
05	3*	0.0	0.0	0.0	-	-	-
05	4	0.0	0.0	0.0	24.0	17.3	19.2
05	5	0.0	0.0	0.0	0.0	0.0	0.0
05	6	0.0	0.0	56.7	68.8	0.0	0.0
06	1	33.3	0.0	57.6	145.5	100.0	63.6
06	2	0.0	0.0	0.0	0.0	0.0	0.0
06	3	0.0	0.0	0.0	0.0	0.0	0.0
06	4	0.0	0.0	0.0	25.0	28.1	0.0
06	5	0.0	0.0	0.0	0.0	0.0	0.0
06	6	49.2	28.8	42.4	0.0	21.1	0.0
07	1*	26.2	26.2	0.0	56.7	0.0	0.0
07	2*	0.0	142.9	128.6	0.0	0.0	418.2
07	3	60.0	110.0	120.0	36.7	0.0	50.0
07	4*	0.0	93.3	0.0	55.6	44.4	0.0
07	5	0.0	154.5	127.3	0.0	0.0	43.9
07	6	28.6	45.7	34.3	209.1	0.0	500.0
08	1	86.7	160.0	0.0	20.0	42.7	94.7
08	2	0.0	0.0	0.0	430.8	492.3	153.8
08	3	68.8	0.0	0.0	361.9	319.0	133.3
08	4	0.0	83.3	190.5	65.1	65.1	765.1
08	5*	-	138.1	0.0	0.0	0.0	352.9
08	6*	40.7	51.9	44.4	47.6	55.6	23.8
09	1*	139.0	102.4	39.0	0.0	0.0	0.0
09	2	188.2	0.0	217.6	77.1	51.4	0.0
09	3*	79.3	75.9	0.0	0.0	0.0	0.0
09	4*	125.0	68.8	137.5	0.0	0.0	0.0
09	5	0.0	0.0	0.0	111.3	124.5	0.0
09	6*	0.0	0.0	0.0	0.0	0.0	0.0
10	1	0.0	0.0	0.0	0.0	0.0	0.0
10	2	0.0	0.0	0.0	212.6	105.1	115.4
10	3	0.0	0.0	0.0	39.2	0.0	82.1
10	4	81.0	147.6	57.1	170.0	260.0	580.0
10	5	0.0	91.7	0.0	131.3	0.0	0.0
10	6	0.0	172.1	39.5	400.0	146.7	273.3

10	1	0.0	0.0	0.0	0.0	0.0	0.0
10	2	0.0	0.0	0.0	212.8	105.1	115.4
10	3	0.0	0.0	0.0	39.2	0.0	82.1
10	4	81.0	147.6	57.1	170.0	260.0	580.0
10	5	0.0	91.7	0.0	131.3	0.0	0.0
10	6	0.0	172.1	39.5	400.0	146.7	273.3
11	1	0.0	0.0	0.0	27.9	83.7	0.0
11	2	81.0	47.6	22.2	0.0	68.6	0.0
11	3	268.8	118.8	312.5	0.0	0.0	0.0
11	4*	0.0	0.0	0.0	0.0	-	-
11	5	65.0	0.0	0.0	0.0	0.0	0.0
11	6	0.0	414.3	200.0	0.0	95.5	0.0
12	1	333.3	216.7	100.0	0.0	0.0	0.0
12	2*	76.5	264.7	82.4	28.9	0.0	0.0
12	3	0.0	0.0	0.0	20.7	31.0	0.0
12	4	0.0	83.3	77.8	0.0	0.0	128.6
12	5	211.8	158.8	88.2	0.0	0.0	0.0
12	6	0.0	0.0	0.0	0.0	39.5	0.0
13	1	86.7	0.0	0.0	0.0	0.0	0.0
13	2	24.5	55.1	104.1	0.0	0.0	126.7
13	3	0.0	323.1	0.0	0.0	0.0	0.0
13	4	71.4	342.9	178.6	0.0	0.0	0.0
13	5	0.0	0.0	0.0	0.0	0.0	0.0
13	6	34.9	0.0	0.0	0.0	0.0	0.0
14	1	21.7	27.5	0.0	76.2	0.0	0.0
14	2	66.7	226.7	0.0	76.1	47.8	69.6
14	3*	-	-	-	-	-	-
14	4	0.0	32.3	0.0	46.7	0.0	86.7
14	5*	0.0	84.8	0.0	23.3	43.3	75.0
14	6*	80.0	110.0	-	0.0	0.0	0.0
15	1*	0.0	0.0	0.0	103.4	286.2	141.4
15	2	0.0	307.1	264.3	48.0	88.0	0.0
15	3	0.0	0.0	0.0	0.0	60.0	0.0
15	4	125.0	62.5	50.0	0.0	0.0	0.0
15	5	0.0	0.0	0.0	0.0	0.0	0.0
15	6	164.3	107.1	378.6	76.9	200.0	0.0
16	1	0.0	0.0	80.0	47.8	0.0	69.6
16	2	34.5	0.0	0.0	0.0	63.0	0.0
16	3*	0.0	0.0	51.5	106.7	93.3	220.0
16	4	180.0	0.0	260.0	0.0	0.0	0.0
16	5	50.0	0.0	75.0	0.0	0.0	0.0
16	6	0.0	0.0	0.0	0.0	187.5	0.0
17	1	0.0	0.0	0.0	31.6	68.4	0.0
17	2	0.0	0.0	0.0	0.0	0.0	0.0
17	3	0.0	0.0	0.0	100.0	75.0	0.0
17	4	52.2	87.0	0.0	135.7	0.0	0.0
17	5	0.0	0.0	0.0	0.0	0.0	0.0
17	6*	0.0	0.0	0.0	0.0	0.0	0.0
18	1*	235.7	-	0.0	0.0	92.3	0.0
18	2*	-	-	-	-	-	-
18	3	144.0	68.0	136.0	0.0	0.0	0.0
18	4	0.0	0.0	0.0	0.0	0.0	0.0
18	5	0.0	0.0	0.0	210.0	0.0	0.0
18	6	0.0	0.0	0.0	0.0	0.0	0.0
19	1	58.8	50.0	0.0	113.0	130.4	100.0
19	2	34.0	38.0	90.0	48.7	44.7	39.5
19	3*	0.0	0.0	0.0	180.0	0.0	113.3
19	4*	-	-	-	-	-	-
19	5	0.0	0.0	0.0	112.5	0.0	56.3
19	6	0.0	0.0	125.0	58.5	56.9	87.7
20	1	75.0	0.0	0.0	0.0	157.1	0.0
20	2	0.0	110.0	100.0	0.0	0.0	110.5
20	3*	0.0	0.0	0.0	0.0	65.4	0.0
20	4	0.0	205.3	63.2	0.0	62.1	0.0
20	5	0.0	0.0	0.0	0.0	57.6	60.6
20	6	0.0	0.0	0.0	0.0	0.0	0.0

* Subject not included in analysis.
- Indicates no data.

Table B-18

Summary of Variables for Blood Count Study No. 1 With Their Means and Standard Deviations
Population = 91

Variable No.	Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01	Total Polymorphonuclear Leucocyte Count - Basal Value	P*	No. of Cells per Cubic Millimeter of Blood	5076.923	±2028.538
02	Total Polymorphonuclear Leucocyte Count - Pre Stress Value	P	No. of Cells per Cubic Millimeter of Blood	4593.407	±2010.835
03	Total Polymorphonuclear Leucocyte Count - Stress Value	P	No. of Cells per Cubic Millimeter of Blood	5120.879	±2126.934
04	Total Polymorphonuclear Leucocyte Count - Post Stress Value	P	No. of Cells per Cubic Millimeter of Blood	5230.769	±1933.[illegible]74
05	Total Polymorphonuclear Leucocyte Count - Basal Value	T**	No. of Cells per Cubic Millimeter of Blood	4307.692	±178[illegible].275
06	Total Polymorphonuclear Leucocyte Count - Pre Stress Value	T	No. of Cells per Cubic Millimeter of Blood	6285.714	±2661.429
07	Total Polymorphonuclear Leucocyte Count - Stress Value	T	No. of Cells per Cubic Millimeter of Blood	6791.209	±2853.637
08	Total Polymorphonuclear Leucocyte Count - Post Stress Value	T	No. of Cells per Cubic Millimeter of Blood	4494.505	±1536.187
09	Total Eosinophil Count - Basal Value	P	No. of Cells per Cubic Millimeter of Blood	160.440	± 168.953
10	Total Eosinophil Count - Pre Stress Value	P	No. of Cells per Cubic Millimeter of Blood	198.901	± 155.369
11	Total Eosinophil Count - Stress Value	P	No. of Cells per Cubic Millimeter of Blood	214.286	± 152.706
12	Total Eosinophil Count - Post Stress Value	P	No. of Cells per Cubic Millimeter of Blood	220.879	± 155.377
13	Total Eosinophil Count - Basal Value	T	No. of Cells per Cubic Millimeter of Blood	186.044	± 132.482
14	Total Eosinophil Count - Pre Stress Value	T	No. of Cells per Cubic Millimeter of Blood	144.176	± 124.204
15	Total Eosinophil Count - Stress Value	T	No. of Cells per Cubic Millimeter of Blood	157.692	± 112.885
16	Total Eosinophil Count - Post Stress Value	T	No. of Cells per Cubic Millimeter of Blood	212.747	± 129.759
17	Total Basophil Count - Basal Value	P	No. of Cells per Cubic Millimeter of Blood	15.275	± 17.563
18	Total Basophil Count - Pre Stress Value	P	No. of Cells per Cubic Millimeter of Blood	14.725	± 19.853
19	Total Basophil Count - Stress Value	P	No. of Cells per Cubic Millimeter of Blood	16.703	± 18.401
20	Total Basophil Count - Post Stress Value	P	No. of Cells per Cubic Millimeter of Blood	15.934	± 18.868
21	Total Basophil Count - Basal Value	T	No. of Cells per Cubic Millimeter of Blood	17.407	± 18.773
22	Total Basophil Count - Pre Stress Value	T	No. of Cells per Cubic Millimeter of Blood	13.297	± 16.578
23	Total Basophil Count - Stress Value	T	No. of Cells per Cubic Millimeter of Blood	15.604	± 36.077
24	Total Basophil Count - Post Stress Value	T	No. of Cells per Cubic Millimeter of Blood	19.560	± 22.430
25	Total Monocyte Count - Basal Value	P	No. of Cells per Cubic Millimeter of Blood	64.066	± 10.457
26	Total Monocyte Count - Pre Stress Value	P	No. of Cells per Cubic Millimeter of Blood	47.912	± 59.031
27	Total Monocyte Count - Stress Value	P	No. of Cells per Cubic Millimeter of Blood	54.835	± 71.104
28	Total Monocyte Count - Post Stress Value	P	No. of Cells per Cubic Millimeter of Blood	39.341	± 55.028
29	Total Monocyte Count - Basal Value	T	No. of Cells per Cubic Millimeter of Blood	42.198	± 57.432
30	Total Monocyte Count - Pre Stress Value	T	No. of Cells per Cubic Millimeter of Blood	39.890	± 63.756
31	Total Monocyte Count - Stress Value	T	No. of Cells per Cubic Millimeter of Blood	50.440	± 67.870
32	Total Monocyte Count - Post Stress Value	T	No. of Cells per Cubic Millimeter of Blood	58.242	± 71.662

* P = Psychological Stress.

** T = Tank Stress.

1

Table B-19

Intercorrelations and Residuals of Variables from Blood C
Population = 91; Significance Levels: P = 0.05, $|r| \geq 0.21$; P

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
01		-.03	-.01	-.08	-.09	-.08	.08	-.03	.03	.03	.06	.00	.02	-.05	.05	-.08	.04	-.01	-.04
02	.66		.03	-.08	-.01	-.09	.00	-.03	.00	.03	.07	-.05	-.01	-.04	-.01	-.09	.02	-.02	.10
03	.57	.74		.10	-.02	-.09	.01	.03	-.02	-.07	.07	-.03	-.05	-.07	-.01	-.10	.02	-.05	.06
04	.50	.65	.76		-.09	-.07	-.07	.09	.01	-.05	.07	.00	-.04	-.03	.09	-.08	.00	-.03	.01
05	.31	.51	.53	.51		-.05	-.04	-.07	.02	-.01	.03	.02	.03	.10	.05	-.10	-.03	-.08	-.05
06	.32	.46	.46	.58	.60		.02	-.04	-.04	-.04	.04	.01	.00	.05	-.01	-.02	-.03	.04	.04
07	.48	.49	.53	.55	.48	.82		-.04	.02	.01	.07	.01	.02	-.03	.02	-.01	-.03	.06	-.02
08	.36	.47	.55	.64	.52	.53	.45		-.03	-.01	.02	-.10	-.04	-.02	-.04	-.01	-.06	.08	-.05
09	-.07	.10	-.08	.00	.13	.00	-.08	.01		.04	.00	.03	.01	.02	-.07	-.02	.09	.04	-.03
10	-.07	.14	-.06	05	.21	.10	.03	.13	.77		-.04	-.01	.02	.00	-.10	.01	.10	.03	.01
11	-.12	.07	-.02	.03	.13	.08	.00	.05	.75	.77		.01	-.05	.05	-.08	.05	-.01	.02	.09
12	.00	.13	.02	.12	.20	.09	.00	.00	.70	.73	.74		.06	.00	-.01	-.05	.10	.02	.00
13	-.02	.11	-.02	.04	.29	.12	.00	.08	.70	.75	.70	.78		.03	-.03	.02	.01	-.01	-.08
14	-.14	.07	-.12	.01	.18	-.06	-.21	-.02	.65	.65	.67	.64	.66		.06	-.01	-.04	-.08	-.09
15	-.05	.03	-.06	.07	.24	-.13	-.22	.02	.52	.51	.52	.59	.64	.69		-.08	.10	-.09	.00
16	.03	.27	.07	.22	.19	.09	.00	.19	.59	.69	.63	.61	.63	.70	.52		-.02	.08	-.01
17	.20	.17	.20	.24	.22	.11	.10	.11	-.10	-.05	-.24	.00	-.08	-.07	.09	.06		.01	.05
18	-.05	.10	.01	.09	.05	.04	.02	.22	.42	.47	.39	.38	.33	.38	.31	.56	.00		.10
19	-.21	-.09	-.09	-.14	.02	.06	-.10	-.07	.14	.13	.26	.10	.14	-.01	.21	.01	.02	.13	
20	.02	.04	.12	.08	.27	.11	-.01	.21	.13	.18	.15	.11	.17	.18	.17	.08	-.07	.19	.17
21	.02	.11	.06	.16	.10	.13	.03	.07	.25	.15	.22	.20	.20	.08	.25	.07	.00	.15	.17
22	.17	.16	.07	.12	.18	-.02	-.09	.17	.19	.08	.16	.13	.19	.10	.28	.10	-.14	.19	.17
23	.11	.00	.02	.00	.39	.20	.07	.14	.08	.02	.02	.06	.26	-.04	.22	-.08	.15	-.09	.15
24	-.04	.00	-.13	-.11	.03	.02	-.07	.06	.15	.03	.07	-.01	-.02	.01	.04	.08	.07	-.02	.24
25	.05	.01	.01	.05	-.05	.07	.06	.02	.24	.07	.10	.05	.14	.07	.03	.08	-.02	.13	.03
26	.10	.00	-.07	-.13	-.02	.04	.00	-.03	.20	.09	.04	-.02	.08	.06	-.01	.12	.06	.33	.16
27	.04	.11	-.08	-.03	-.05	.08	-.01	-.08	.17	.05	.16	.10	.11	.18	.11	.09	-.03	.14	.27
28	-.23	-.07	-.13	-.02	-.07	.00	-.08	-.11	.28	.09	.11	.09	.10	.22	.17	.09	.02	.19	.13
29	.22	.17	.04	.14	.02	.17	.11	.01	.05	-.10	.02	.04	.10	.09	.05	.06	.14	.08	.05
30	.03	.14	.04	.04	.04	.12	-.05	.11	.18	.09	.07	.04	.14	.22	.19	.22	-.01	.37	.14
31	-.06	.03	-.04	-.01	-.02	.17	.05	-.02	.05	-.05	.05	-.03	-.01	.01	-.04	-.07	-.03	.15	.12
32	-.01	.04	.05	-.04	.08	.19	.11	.09	.05	-.07	-.04	-.10	-.03	-.04	.14	.05	.04	.07	.06

Table B-19

ations and Residuals of Variables from Blood Count Study No. 1
1 ; Significance Levels: P = 0.05, |r| ≥ 0.21; P = 0.01, |r| ≥ 0.27

Residuals

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
.00	.02	-.05	.05	-.08	.04	-.01	-.04	.06	-.08	.07	.10	-.01	.05	.03	.08	-.04	.08	.09	.00	-.02
-.05	-.01	-.04	-.01	-.09	.02	-.02	.10	.03	-.03	.05	-.01	.05	-.07	-.01	.08	-.03	-.03	.08	.04	-.08
-.03	-.05	-.07	-.01	-.10	.02	-.05	.06	.01	-.02	-.03	-.06	-.04	.05	.00	-.02	.00	-.05	.00	.02	.04
.00	-.04	-.03	.09	-.08	.00	-.03	.01	.06	.08	.09	-.07	.00	.06	-.07	.01	.07	.00	-.02	.04	-.08
.02	.03	.10	.05	-.10	-.03	-.08	-.05	-.04	.03	-.02	.09	-.05	.05	.01	.00	.00	.04	-.09	.02	.02
.01	.00	.05	-.01	-.02	-.03	.04	.04	.02	.05	-.10	-.04	.00	.04	.03	-.02	.03	.08	.05	.07	.02
.01	.02	-.03	.02	-.01	-.03	.06	-.02	-.05	.02	.00	-.07	.06	.05	.05	-.05	.01	.01	-.05	.00	.02
-.10	-.04	-.02	-.04	-.01	-.06	.08	-.05	.01	.00	-.01	-.03	.09	.09	-.08	-.01	-.08	.04	-.04	.00	.04
.03	.01	.02	-.07	-.02	.09	.04	-.03	-.04	.03	-.07	.03	.05	.10	.06	.00	.05	.04	-.01	-.02	.00
-.01	.02	.00	-.10	.01	.10	.03	.01	-.03	.02	-.07	-.02	.08	.07	.05	.04	-.05	.03	-.06	.00	.01
.01	-.05	.05	-.08	.05	-.01	.02	.09	-.09	.07	-.01	-.02	.09	.05	.03	.08	-.01	.10	-.02	.05	.05
	.06	.00	-.01	-.05	.10	.02	.00	-.04	.02	-.01	.04	.02	.02	.06	.05	.07	.01	.01	.03	.03
.78		.03	-.03	-.02	.01	-.01	-.08	-.10	-.05	-.09	.10	-.09	.05	.10	-.07	.02	-.01	.01	-.05	.01
.64	.66		.06	-.01	-.04	-.08	-.09	.05	-.07	.03	-.02	.03	-.08	-.09	.01	-.03	-.08	-.01	-.02	-.08
.59	.64	.69		-.08	.10	-.09	.00	-.09	.01	-.07	.09	-.08	-.03	-.06	.01	.04	-.01	-.04	-.05	-.09
.61	.63	.70	.52		-.02	.08	-.01	.01	-.09	-.03	-.06	.09	.04	.04	.09	-.07	.05	.03	.00	.04
.00	-.08	-.07	.09	.06		.01	.05	-.05	.05	-.07	.06	.03	.06	.10	.03	.09	.07	-.03	.03	.01
.38	.33	.38	.31	.56	.00		.10	.06	.00	.01	-.08	.10	.04	.09	.07	-.08	.02	.01	.10	.03
.10	.14	-.01	.21	.01	.02	.13		.04	.03	-.08	-.05	.02	-.07	.07	.07	.04	-.05	.01	-.04	-.05
.11	.17	.18	.17	.08	-.07	.19	.17		.02	.07	.04	.01	.08	-.01	-.08	.07	-.02	.05	-.08	-.06
.20	.20	.08	.25	.07	.00	.15	.17	-.01		.03	.07	.07	.05	-.07	.09	-.07	.00	.00	-.04	-.05
.13	.19	.10	.28	.10	-.14	.19	.17	.12	.49		-.08	-.05	.09	.09	.00	.01	.08	-.01	-.02	-.03
.06	.26	-.04	.22	-.08	.15	-.09	.15	.27	.17	.11		-.01	.00	-.03	-.10	-.08	.07	-.07	.02	.09
-.01	-.02	.01	.04	.08	.07	-.02	.24	-.04	.22	.31	.16		.05	.00	.01	.04	.02	.09	-.09	.10
.05	.14	.07	.03	.08	-.02	.13	.03	.07	.29	.20	.08	.13		-.08	-.10	-.03	-.05	.10	-.05	-.10
-.02	.08	.06	-.01	.12	.06	.33	.16	.10	.01	.21	.05	.11	.29		.10	.10	.05	.10	.05	.01
.10	.11	.18	.11	.09	-.03	.14	.27	.01	.39	.15	.10	.15	.51	.31		-.05	-.08	.10	.04	.00
.09	.10	.22	.17	.09	.02	.19	.13	.18	.01	.06	-.02	.12	.37	.54	.39		-.02	-.05	-.04	-.11
.04	.10	.09	.05	.06	.14	.08	.05	.00	.32	.11	.23	.03	.60	.23	.76	.31		.03	-.01	.07
.04	.14	.22	.19	.22	-.01	.37	.14	.25	.22	.30	.09	.15	.43	.67	.49	.49	.38		-.04	.05
-.03	-.01	.01	-.04	-.07	-.03	.15	.12	-.04	.18	.16	.17	.04	.39	.44	.60	.34	.52	.33		.01
-.10	-.03	-.04	-.14	.05	.04	.07	.06	-.05	.07	.07	.24	.32	.31	.51	.50	.38	.50	.45	.42	

2

Table B-20

Rotated Factor Loadings of Blood Count Study No. 1
Population = 91

Variable No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	9	h^2‡
01	Total Polymorphonuclear Leucocyte Count - Basal Value (P)*	.71	-.15	-.03	-.03	-.13	-.02	-.10	-.03	.21	.60
02	Total Polymorphonuclear Leucocyte Count - Pre Stress Value (P)	.90	.07	-.06	.08	-.06	.05	.00	.00	.25	.89
03	Total Polymorphonuclear Leucocyte Count - Stress Value (P)	.79	-.11	.07	-.03	-.09	.01	.06	.05	.01	.66
04	Total Polymorphonuclear Leucocyte Count - Post Stress Value (P)	.84	-.05	.01	-.02	.04	.18	.03	-.08	-.09	.76
05	Total Polymorphonuclear Leucocyte Count - Basal Value (T)**	.66	-.02	.45	-.08	.19	.13	.07	.19	-.14	.76
06	Total Polymorphonuclear Leucocyte Count - Pre Stress Value (T)	.74	-.04	.16	.03	.44	-.15	.02	-.11	-.32	.91
07	Total Polymorphonuclear Leucocyte Count - Stress Value (T)	.69	-.12	-.05	-.02	.31	-.14	.03	-.09	-.38	.76
08	Total Polymorphonuclear Leucocyte Count - Post Stress Value (T)	.62	-.04	.27	-.03	.07	.04	.20	.04	-.13	.52
09	Total Eosinophil Count - Basal Value (P)	.03	.81	.23	.11	.08	.05	-.02	.00	.07	.74
10	Total Eosinophil Count - Pre Stress Value (P)	.11	.85	.20	-.07	.07	.15	.09	.01	-.14	.83
11	Total Eosinophil Count - Stress Value (P)	-.01	.88	.20	-.04	.03	-.01	-.03	.07	-.13	.84
12	Total Eosinophil Count - Post Stress Value (P)	.16	.78	.16	-.08	-.04	.19	-.17	.02	-.06	.74
13	Total Eosinophil Count - Basal Value (T)	.12	.74	.37	.03	.00	.13	-.22	.11	-.11	.79
14	Total Eosinophil Count - Pre Stress Value (T)	.02	.70	.07	.15	-.05	.44	-.05	.08	.05	.73
15	Total Eosinophil Count - Stress Value (T)	-.04	.58	.46	.06	-.16	.34	-.09	.12	.04	.72
16	Total Eosinophil Count - Post Stress Value (T)	.29	.66	.13	.00	.03	.52	.04	-.04	.12	.83
17	Total Basophil Count - Basal Value (P)	.19	-.29	.09	-.05	.09	.38	-.05	.07	.00	.29
18	Total Basophil Count - Pre Stress Value (P)	.09	.41	.13	.19	-.18	.32	.29	-.07	-.09	.46
19	Total Basophil Count - Stress Value (P)	-.17	.09	.37	.15	.13	-.05	-.13	.03	-.08	.24
20	Total Basophil Count - Post Stress Value (P)	.08	.14	.31	.07	-.09	-.09	.16	.57	-.22	.54
21	Total Basophil Count - Basal Value (T)	.12	.15	.29	.31	-.18	-.04	-.19	-.27	.03	.36
22	Total Basophil Count - Pre Stress Value (T)	.08	.10	.74	.22	-.22	-.18	.01	-.37	.21	.87
23	Total Basophil Count - Stress Value (T)	.08	-.08	.39	.15	.17	-.03	-.10	.17	-.16	.28
24	Total Basophil Count - Post Stress Value (T)	-.11	-.07	.41	.12	.30	-.06	-.18	-.07	.36	.46
25	Total Monocyte Count - Basal Value (P)	.02	.10	-.09	.57	.03	-.04	-.18	-.03	.01	.50
26	Total Monocyte Count - Pre Stress Value (P)	-.07	.06	.02	.66	.19	.06	.41	.06	.10	.67
27	Total Monocyte Count - Stress Value (P)	.00	.09	.02	.81	.09	-.08	-.33	.07	-.12	.81
28	Total Monocyte Count - Post Stress Value (P)	-.12	.18	-.03	.65	.19	.11	.33	.07	.05	.63
29	Total Monocyte Count - Basal Value (T)	.17	-.06	-.14	.83	-.14	.13	-.52	.08	-.18	<u>1.09</u>
30	Total Monocyte Count - Pre Stress Value (T)	.03	.08	.26	.63	-.05	.18	.36	.00	-.07	.64
31	Total Monocyte Count - Stress Value (T)	-.03	-.01	.06	.63	.10	-.11	-.08	-.05	-.09	.44
32	Total Monocyte Count - Post Stress Value (T)	.06	-.07	.02	.63	.34	.01	.07	.03	.15	.55

* P = Psychological Stress.

** T = Tank Stress.

‡ h^2 = Communality; underlined communality value needs final adjustment to reduce it to 1.00 or less.

Table B-21

Summary of Variables for Blood Count Study No. 2 With Their Means and Standard Deviations
Population = 92

Variable No.	Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01	Total Lymphocyte Count - Basal Value	P*	Percent of Total Leucocyte Count	39.511	± 8.497
02	Total Lymphocyte Count - Pre Stress Value	P	Percent of Total Leucocyte Count	36.065	± 8.047
03	Total Lymphocyte Count - Stress Value	P	Percent of Total Leucocyte Count	36.761	± 7.877
04	Total Lymphocyte Count - Post Stress Value	P	Percent of Total Leucocyte Count	35.239	± 7.150
05	Total Lymphocyte Count - Basal Value	T**	Percent of Total Leucocyte Count	36.707	± 7.016
06	Total Lymphocyte Count - Pre Stress Value	T	Percent of Total Leucocyte Count	30.630	± 9.363
07	Total Lymphocyte Count - Stress Value	T	Percent of Total Leucocyte Count	30.228	± 8.434
08	Total Lymphocyte Count - Post Stress Value	T	Percent of Total Leucocyte Count	41.848	± 7.243
09	Total Leucocyte Count - Basal Value	P	No. of Cells per Cubic Millimeter of Blood	9141.304	±2291.674
10	Total Leucocyte Count - Pre Stress Value	P	No. of Cells per Cubic Millimeter of Blood	7815.217	±2349.511
11	Total Leucocyte Count - Stress Value	P	No. of Cells per Cubic Millimeter of Blood	8891.304	±2495.457
12	Total Leucocyte Count - Post Stress Value	P	No. of Cells per Cubic Millimeter of Blood	8760.870	±2388.239
13	Total Leucocyte Count - Basal Value	T	No. of Cells per Cubic Millimeter of Blood	7597.826	±2431.946
14	Total Leucocyte Count - Pre Stress Value	T	No. of Cells per Cubic Millimeter of Blood	9434.783	±2798.696
15	Total Leucocyte Count - Stress Value	T	No. of Cells per Cubic Millimeter of Blood	10163.043	±2964.565
16	Total Leucocyte Count - Post Stress Value	T	No. of Cells per Cubic Millimeter of Blood	8750.000	±2204.859
17	Total Lymphocyte Count - Basal Value	P	No. of Cells per Cubic Millimeter of Blood	3217.391	±1040.761
18	Total Lymphocyte Count - Pre Stress Value	P	No. of Cells per Cubic Millimeter of Blood	2423.913	± 824.011
19	Total Lymphocyte Count - Stress Value	P	No. of Cells per Cubic Millimeter of Blood	2869.565	± 911.489
20	Total Lymphocyte Count - Post Stress Value	P	No. of Cells per Cubic Millimeter of Blood	2673.913	± 809.033
21	Total Lymphocyte Count - Basal Value	T	No. of Cells per Cubic Millimeter of Blood	2347.826	± 743.598
22	Total Lymphocyte Count - Pre Stress Value	T	No. of Cells per Cubic Millimeter of Blood	2347.826	± 839.707
23	Total Lymphocyte Count - Stress Value	T	No. of Cells per Cubic Millimeter of Blood	2532.609	± 800.152
24	Total Lymphocyte Count - Post Stress Value	T	No. of Cells per Cubic Millimeter of Blood	3315.217	± 999.228

* P = Psychological Stress.

** T = Tank Stress.

Table B-22

Intercorrelations and Residuals* of Variables from Blood Count Study No. 2
Population = 92; Significance Levels: P = 0.05, $|r| \geq 0.21$; P = 0.01, $|r| \geq 0.27$

Residuals (above diagonal); Intercorrelations (below diagonal)

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
01		.03	-.08	-.04	.[illegible]1	.07	-.08	-.06	-.13	.08	-.20	.08	-.01	.16	.05	.05	-.12	.02	.02	-.06	-.05	.01	-.02	-.06
02	.69		-.06	-.02	.[illegible]0	.14	-.08	-.02	-.05	-.02	.02	.03	.00	.05	.02	.00	-.03	.10	-.07	-.03	-.02	-.06	-.04	-.02
03	.54	.72		-.01	.[illegible]0	.14	-.03	-.07	.04	.00	-.09	-.01	.00	.06	-.03	-.04	-.08	-.02	-.04	-.16	-.08	-.10	-.06	-.09
04	.55	.66	.78		.[illegible]6	.16	-.04	-.02	.03	.01	-.02	-.05	.00	.03	.02	-.03	-.02	-.07	.00	-.05	-.03	-.12	-.02	-.03
05	.47	.61	.62	.64		.30	.06	.02	-.09	-.13	-.29	.00	-.08	-.01	-.09	.00	-.24	-.15	-.16	-.24	-.03	-.12	-.12	.00
06	.41	.57	.58	.58	.[illegible]6		.01	.08	.02	-.03	.08	-.04	-.03	-.17	.01	.08	.16	.03	.17	.23	.11	.02	-.07	.15
07	.38	.50	.60	.55	.[illegible]8	.85		-.01	.01	.00	-.03	.01	.03	.03	-.03	.00	.01	-.11	-.04	-.07	-.05	.04	.15	-.04
08	.42	.52	.54	.53	.[illegible]0	.50	.51		-.04	-.04	-.12	-.01	.00	.05	.04	-.15	-.12	-.11	-.11	-.14	-.06	-.06	.00	.08
09	-.33	-.44	-.41	-.34	-.[illegible]8	-.25	-.27	-.29		-.04	-.11	.00	.00	-.07	.08	.00	.04	-.16	-.02	-.09	-.03	-.04	-.07	-.03
10	-.12	-.43	-.48	-.40	-.[illegible]3	-.22	-.23	-.35	.57		-.03	.00	.07	-.02	.05	-.01	-.14	.15	-.03	-.07	.04	.03	-.05	-.05
11	-.49	-.32	-.41	-.30	-.[illegible]1	-.24	-.24	-.40	.55	.70		.08	.02	.05	.03	-.08	-.10	-.18	.00	-.31	-.14	-.05	-.09	-.17
12	-.07	-.34	-.43	-.42	-.[illegible]1	-.26	-.26	-.34	.52	.60	.69		.00	.00	.07	.04	.01	-.01	.04	.07	.00	.03	-.05	.03
13	-.13	-.34	-.39	-.33	-.[illegible]3	-.35	-.30	-.46	.37	.54	.52	.58		.00	.00	-.06	.04	.01	.01	.03	.01	.00	.01	.05
14	-.05	-.42	-.47	-.51	-.[illegible]6	-.59	-.51	-.38	.39	.47	.41	.57	.61		.07	.03	-.03	.16	.02	.13	.06	.14	.01	.06
15	-.24	-.43	-.47	-.44	-.[illegible]6	-.64	-.63	-.36	.53	.49	.53	.56	.55	.75		-.03	-.04	.17	-.03	.02	.04	.01	.11	-.01
16	.08	-.09	-.14	-.14	-.[illegible]9	-.17	-.12	-.27	.42	.49	.51	.61	.53	.52	.45		-.14	-.08	-.10	.19	-.09	.07	-.08	.02
17	.63	.28	.15	.18	.[illegible]6	.09	.10	.10	.43	.[illegible]0	.32	.35	.19	.26	.20	.43		-.23	-.19	-.15	-.15	-.16	-.15	-.17
18	.46	.31	.12	.15	.[illegible]0	.23	.21	.04	.18	.59	.36	.31	.29	.16	.15	.40	.53		-.10	-.22	-.12	.09	.00	-.12
19	.36	.32	.49	.37	.[illegible]8	.21	.24	.09	.12	.17	.52	.21	.20	.01	.09	.36	.44	.42		-.19	-.12	-.12	-.08	-.13
20	.38	.28	.26	.48	.[illegible]2	.25	.23	.12	.20	.20	.31	.47	.19	.03	.09	.38	.48	.44	.44		-.16	-.16	-.15	-.20
21	.35	.16	.12	.17	.[illegible]0	.09	.07	-.01	.18	.30	.26	.30	.61	.28	.29	.42	.38	.43	.37	.37		-.06	-.02	.02
22	.41	.24	.25	.16	.[illegible]6	.53	.48	.21	.10	.24	.17	.26	.13	.26	.00	.29	.37	.53	.36	.36	.35		-.07	-.10
23	.20	.17	.24	.19	.[illegible]4	.37	.56	.22	.14	.23	.30	.22	.19	.11	.16	.33	.25	.45	.45	.32	.40	.57		-.09
24	.36	.30	.29	.29	.[illegible]9	.20	.24	.49	.13	.94	.08	.22	.06	.11	.12	.62	.44	.34	.36	.42	.35	.36	.40	

* Additional adjustments required for variables 05, 08, 10 and 20.

Table B-23

Rotated Factor Loadings of Blood Count Study No. 2
Population = 92

Variable No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	9	h2**
01	Total Lymphocyte Count - Basal Value (P)‡	.72	.20	-.18	-.20	.10	-.01	.44	.09	-.30	0.93
02	Total Lymphocyte Count - Pre Stress Value (P)	.74	-.07	-.13	.14	.03	.00	.10	.16	-.29	0.71
03	Total Lymphocyte Count - Stress Value (P)	.84	-.06	.00	.29	-.01	-.05	-.09	.19	-.34	0.96
04	Total Lymphocyte Count - Post Stress Value (P)	.79	-.07	-.15	.08	.04	-.03	-.11	.11	-.20	0.72
05*	Total Lymphocyte Count - Basal Value (T)‡‡	.85	-.02	.17	.02	-.22	-.22	-.01	-.14	.28	0.95
06	Total Lymphocyte Count - Pre Stress Value (T)	.53	-.19	-.03	.08	-.01	.85	.02	.10	.02	1.06
07	Total Lymphocyte Count - Stress Value (T)	.68	-.11	-.20	.16	.02	.49	-.05	.18	.02	0.82
08*	Total Lymphocyte Count - Post Stress Value (T)	.68	-.13	.02	-.02	-.14	.02	.02	.27	.03	0.57
09	Total Leucocyte Count - Basal Value (P)	-.28	.54	.02	-.06	-.14	-.02	.06	-.11	.39	0.56
10*	Total Leucocyte Count - Pre Stress Value (P)	-.34	.62	-.09	.02	-.09	.12	.12	-.13	.39	0.71
11	Total Leucocyte Count - Stress Value (P)	-.22	.74	-.17	.31	-.09	-.09	-.18	-.19	.48	1.04
12	Total Leucocyte Count - Post Stress Value (P)	-.36	.67	-.01	-.09	.05	.12	-.02	-.03	.15	0.63
13	Total Leucocyte Count - Basal Value (T)	-.38	.61	.03	.02	.63	.01	.01	-.13	.02	0.93
14	Total Leucocyte Count - Pre Stress Value (T)	-.54	.57	.37	-.15	.09	-.01	.20	-.00	-.05	0.83
15	Total Leucocyte Count - Stress Value (T)	-.47	.54	.32	-.02	.05	-.33	.01	-.05	.04	0.73
16	Total Leucocyte Count - Post Stress Value (T)	-.12	.80	-.10	.03	.17	-.08	.02	.34	.06	0.82
17	Total Lymphocyte Count - Basal Value (P)	.41	.79	-.15	-.07	-.27	-.16	.66	-.03	-.01	1.35
18	Total Lymphocyte Count - Pre Stress Value (P)	.35	.57	-.43	.06	.11	.12	.23	-.03	.32	0.82
19	Total Lymphocyte Count - Stress Value (P)	.41	.59	-.10	.60	-.03	-.12	-.01	.04	-.08	0.91
20*	Total Lymphocyte Count - Post Stress Value (P)	.60	.90	-.50	-.39	-.23	-.10	-.76	-.16	-.14	2.25
21	Total Lymphocyte Count - Basal Value (T)	.34	.60	.04	.04	.55	-.08	.09	-.11	.12	0.82
22	Total Lymphocyte Count - Pre Stress Value (T)	.42	.53	.15	.09	-.04	.42	.06	.13	-.01	0.69
23	Total Lymphocyte Count - Stress Value (T)	.35	.52	.16	.24	.01	.37	-.07	.17	.17	0.68
24	Total Lymphocyte Count - Post Stress Value (T)	.37	.52	-.07	-.04	-.09	-.14	.01	.77	.15	1.06

* Additional adjustments required.

** h^2 = Communality; underlined communality values need final adjustment to reduce them to 1.00 or less.

‡ P = Psychological stress.

‡‡ T = Tank stress.

Table B-24

Summary of Variables for Blood Count Study No. 3 With Their Means and Standard Deviations
Population = 94

Variable No.	Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01	Total Polymorphonuclear Leucocyte Count - Basal Value	P*	Percent of Total Leucocyte Count	57.532	± 9.455
02	Total Polymorphonuclear Leucocyte Count - Pre Stress Value	P	Percent of Total Leucocyte Count	60.787	± 8.598
03	Total Polymorphonuclear Leucocyte Count - Stress Value	P	Percent of Total Leucocyte Count	60.032	± 8.535
04	Total Polymorphonuclear Leucocyte Count - Post Stress Value	P	Percent of Total Leucocyte Count	61.840	± 7.733
05	Total Polymorphonuclear Leucocyte Count - Basal Value	T**	Percent of Total Leucocyte Count	59.713	± 9.044
06	Total Polymorphonuclear Leucocyte Count - Pre Stress Value	T	Percent of Total Leucocyte Count	67.691	±10.254
07	Total Polymorphonuclear Leucocyte Count - Stress Value	T	Percent of Total Leucocyte Count	67.947	± 9.135
08	Total Polymorphonuclear Leucocyte Count - Post Stress Value	T	Percent of Total Leucocyte Count	55.309	± 7.957
09	Total Eosinophil Count - Basal Value	P	Percent of Total Leucocyte Count	21.277	±17.639
10	Total Eosinophil Count - Pre Stress Value	P	Percent of Total Leucocyte Count	24.362	±15.667
11	Total Eosinophil Count - Stress Value	P	Percent of Total Leucocyte Count	22.872	±17.662
12	Total Eosinophil Count - Post Stress Value	P	Percent of Total Leucocyte Count	23.617	±18.093
13	Total Eosinophil Count - Basal Value	T	Percent of Total Leucocyte Count	23.574	±14.628
14	Total Eosinophil Count - Pre Stress Value	T	Percent of Total Leucocyte Count	13.404	±14.259
15	Total Eosinophil Count - Stress Value	T	Percent of Total Leucocyte Count	15.351	±11.907
16	Total Eosinophil Count - Post Stress Value	T	Percent of Total Leucocyte Count	23.298	±13.330
17	Total Basophil Count - Basal Value	P	Percent of Total Leucocyte Count	1.660	± 1.831
18	Total Basophil Count - Pre Stress Value	P	Percent of Total Leucocyte Count	1.745	± 2.188
19	Total Basophil Count - Stress Value	P	Percent of Total Leucocyte Count	1.979	± 2.255
20	Total Basophil Count - Post Stress Value	P	Percent of Total Leucocyte Count	1.766	± 2.271
21	Total Basophil Count - Basal Value	T	Percent of Total Leucocyte Count	1.755	± 2.132
22	Total Basophil Count - Pre Stress Value	T	Percent of Total Leucocyte Count	1.447	± 1.933
23	Total Basophil Count - Stress Value	T	Percent of Total Leucocyte Count	1.468	± 2.669
24	Total Basophil Count - Post Stress Value	T	Percent of Total Leucocyte Count	2.064	± 2.479
25	Total Monocyte Count - Basal Value	P	Percent of Total Leucocyte Count	7.138	±10.118
26	Total Monocyte Count - Pre Stress Value	P	Percent of Total Leucocyte Count	6.213	± 7.551
27	Total Monocyte Count - Stress Value	P	Percent of Total Leucocyte Count	6.691	± 8.819
28	Total Monocyte Count - Post Stress Value	P	Percent of Total Leucocyte Count	4.489	± 6.128
29	Total Monocyte Count - Basal Value	T	Percent of Total Leucocyte Count	5.787	± 8.153
30	Total Monocyte Count - Pre Stress Value	T	Percent of Total Leucocyte Count	4.043	± 6.228
31	Total Monocyte Count - Stress Value	T	Percent of Total Leucocyte Count	5.117	± 7.089
32	Total Monocyte Count - Post Stress Value	T	Percent of Total Leucocyte Count	6.819	± 7.897

* P = Psychological Stress.

** T = Tank Stress.

Table B-25

Intercorrelations and Residuals of Variables from Blood Count Stuc
Population = 94; Significance Levels: P = 0.05, |r| ≥ 0.17; P = 0.01,

Residuals

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
01		.07	-.03	.02	-.11	.02	.00	.04	-.06	.03	.00	.06	.04	.00	.00	.02	.01	-.03	.05	.00
02	.70		-.02	.01	-.13	-.04	-.08	-.09	.00	-.16	.03	-.03	-.14	.04	-.05	-.04	.01	-.17	-.01	.05
03	.54	.73		.08	-.01	-.05	-.01	-.06	.04	-.07	-.02	.00	-.03	-.05	-.01	-.01	.03	-.10	-.04	.07
04	.57	.69	.80		.11	-.02	-.01	.05	.02	-.01	-.04	-.03	.01	-.01	.03	.05	.01	.00	-.02	.05
05	.34	.44	.53	.58		.00	.01	.02	.01	-.12	.10	-.04	-.09	.03	-.05	-.03	-.05	-.09	-.08	.06
06	.47	.56	.57	.58	.50		.00	-.01	-.03	-.03	.00	.02	.02	.01	.08	-.07	-.08	-.02	-.03	.02
07	.42	.52	.61	.56	.47	.87		.00	.01	-.03	.02	.01	-.01	-.01	-.01	-.02	-.01	-.03	-.02	.03
08	.50	.49	.51	.52	.50	.54	.53		.04	-.02	.03	-.03	-.05	.01	.00	-.11	-.02	.02	-.01	-.02
09	-.45	-.26	-.34	-.39	-.23	-.28	-.29	-.25		-.04	.03	-.02	-.02	.09	-.03	-.04	.00	.01	.01	-.02
10	-.24	-.28	-.35	-.35	-.21	-.16	-.19	-.13	.70		.06	-.04	-.02	.07	-.07	-.09	.01	-.01	.05	-.04
11	-.37	-.32	-.47	-.48	-.32	-.28	-.32	-.28	.80	.74		.06	.08	-.10	-.07	.01	.02	.05	-.05	.08
12	-.23	-.19	-.31	-.39	-.21	-.21	-.26	-.21	.74	.72	.75		.02	.06	-.03	-.06	-.03	.02	.02	-.02
13	-.19	-.22	-.23	-.27	-.21	-.26	-.28	-.18	.64	.65	.62	.72		.02	-.02	-.05	-.07	-.03	.02	-.09
14	-.38	-.29	-.43	-.43	-.30	-.62	-.57	-.35	.63	.56	.65	.65	.58		.07	.10	.03	-.04	-.02	.05
15	-.33	-.33	-.36	-.37	-.29	-.56	-.64	-.35	.54	.46	.53	.58	.58	.78		-.01	.01	-.08	.03	-.04
16	-.24	-.11	-.18	-.19	-.17	-.28	-.19	-.25	.63	.58	.64	.62	.60	.62	.50		.00	.00	.08	-.01
17	.03	.09	.17	.15	.02	.12	.09	-.01	-.01	.01	-.21	-.07	-.10	-.05	.12	.02		.03	.03	-.04
18	-.20	-.21	-.16	-.13	-.12	-.21	-.15	-.02	.28	.26	.23	.30	.27	.24	.18	.30	-.01		.05	.03
19	-.04	-.15	-.22	-.16	-.06	-.04	-.15	-.08	.19	.23	.28	.15	.10	-.02	.17	.08	.08	.07		.01
20	-.16	-.10	-.11	-.16	.09	-.13	-.14	-.04	.14	.18	.19	.16	.07	.20	.19	.05	-.10	.18	.25	
21	-.10	-.11	-.11	-.10	-.09	-.15	-.20	-.12	.21	.13	.17	.08	.15	.03	.12	.10	.03	.09	.17	-.08
22	.01	-.16	-.08	-.09	-.03	-.36	-.32	-.13	.04	-.01	.05	.04	.10	.11	.24	-.01	-.13	.06	.01	.08
23	.13	.03	.01	.01	.14	.01	-.11	.07	.08	.06	.06	.07	.11	-.03	.21	-.08	.10	-.09	.23	.17
24	-.05	-.04	-.13	-.07	.06	-.04	-.09	-.18	.19	.12	.18	.08	.02	.02	.05	.08	.05	-.08	.34	.05
25	-.14	-.07	.01	.04	-.01	-.06	-.03	-.18	.18	.00	.11	-.01	.05	.07	.07	.04	.08	.07	.10	.05
26	-.29	-.29	-.07	-.12	-.07	-.10	-.02	-.12	.06	.04	.03	-.06	.00	.00	.04	.05	.14	.23	.15	.16
27	-.05	.00	-.06	.01	-.05	-.13	-.15	-.18	.19	.01	.19	.12	.07	.15	.19	.07	.01	.04	.28	.03
28	-.43	-.19	-.17	-.20	-.05	-.22	-.16	-.24	.25	.09	.19	.10	.09	.25	.23	.13	.04	.18	.19	.26
29	.08	.13	.09	.19	-.09	-.06	.00	-.14	-.01	-.18	-.03	-.04	-.01	.00	.00	.02	.08	.04	.04	-.06
30	-.22	-.13	-.02	-.02	-.04	-.26	-.26	-.11	.12	.02	.06	.02	.09	.19	.22	.12	-.03	.28	.06	.24
31	-.05	-.04	-.07	.03	.01	-.13	-.15	-.05	.09	-.07	.06	-.02	-.02	.04	.03	.02	.06	.08	.16	-.06
32	-.12	.01	.17	.14	.09	.07	.14	-.01	.02	-.10	-.06	-.10	-.13	-.10	-.12	.00	.08	.01	.05	-.10

1

Table B-25

...tions and Residuals of Variables from Blood Count Study No. 3

...; Significance Levels: $P = 0.05, |r| \geq 0.17$; $P = 0.01, |r| \geq 0.27$

Residuals

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
.06	.04	.00	.00	.02	.01	-.03	.05	.00	-.07	-.02	.01	.01	.00	.02	.04	-.01	.03	-.01	.00	-.01
-.03	-.14	.04	-.05	-.04	.01	-.17	-.01	.05	-.02	.12	-.04	.04	.01	-.08	.03	.13	.05	-.07	-.04	-.04
.00	-.03	-.05	-.01	-.01	.03	-.10	-.04	.07	.04	.01	-.02	.03	.03	-.01	-.03	.03	-.03	-.05	-.14	.01
-.03	.01	-.01	.03	.05	.01	.00	-.02	.05	-.02	.02	-.03	.04	.00	-.04	-.03	.00	-.03	.01	-.07	.00
-.04	-.09	.03	-.05	-.03	-.05	-.09	-.08	.06	.02	.00	.02	.04	.05	-.05	-.03	.10	-.08	-.04	.00	.01
.02	.02	.01	.08	-.07	-.08	-.02	-.03	.02	.12	.00	.01	-.08	-.01	-.02	-.05	-.04	-.05	.06	-.01	-.07
.01	-.01	-.01	-.01	-.02	-.01	-.03	-.02	.03	.06	.06	-.01	-.03	.05	.03	-.02	.03	.05	-.10	-.04	-.02
-.03	-.05	.01	.00	-.11	-.02	.02	-.01	-.02	.07	.02	.03	-.07	-.01	.01	-.01	.01	-.01	-.02	.07	.00
-.02	-.02	.09	-.03	-.04	.00	.01	.01	-.02	.07	.02	.02	-.07	.02	-.01	-.05	-.01	-.03	.01	.02	-.01
-.04	-.02	.07	-.07	-.09	.01	-.01	.05	-.04	.09	.05	-.02	-.14	.03	.06	-.04	-.04	.02	-.01	.02	-.05
.06	.08	-.10	-.07	.01	.02	.05	-.05	.08	-.02	-.03	-.02	.09	-.02	-.04	.01	.02	-.03	.00	-.06	.02
	.02	.06	-.03	-.06	-.03	.02	.02	-.02	.02	-.03	.00	-.04	-.03	.03	.02	-.04	.04	.02	.03	.01
.72		.02	-.02	-.05	-.07	-.03	.02	-.09	.06	-.01	.06	-.08	.04	.04	-.03	-.02	.06	-.03	-.03	-.07
.65	.58		.07	.10	.03	-.04	-.02	.05	-.10	.01	-.03	.12	-.01	-.02	.03	.05	-.03	-.03	-.05	-.01
.58	.58	.78		-.01	.01	-.08	.03	-.04	-.04	-.06	.01	.00	-.01	.00	.02	.01	-.02	.02	-.08	.00
.62	.60	.62	.50		.00	.00	.08	-.01	.03	-.10	-.07	-.08	.01	.04	-.02	-.02	.10	-.05	.02	-.04
-.07	-.10	-.05	.12	.02		.03	.03	-.04	.07	.09	.01	-.09	.03	.04	-.02	-.03	.06	-.02	.04	-.02
.30	.27	.24	.18	.30	-.01		.05	.03	.07	.04	-.08	-.12	.00	.04	-.04	-.03	.08	-.02	.00	-.12
.15	.10	-.02	.17	.08	.08	.07		.01	.06	.05	.01	.05	-.05	.00	.05	-.01	-.03	.06	.04	.00
.16	.07	.20	.19	.05	-.10	.18	.25		-.06	-.05	.03	.00	.00	-.04	-.06	.02	.00	.08	-.11	-.13
.08	.15	.03	.12	.10	.03	.09	.17	-.08		-.18	.01	.07	.01	.02	-.02	-.06	-.04	.02	-.05	-.03
.04	.10	.11	.24	-.01	-.13	.06	.01	.08	.45		.00	.11	-.04	-.01	.07	.01	.01	.03	.05	.09
.07	.11	-.03	.21	-.08	.10	-.09	.23	.17	.14	.12		-.05	.05	.04	.00	-.01	.03	.00	.06	.12
.08	.02	.02	.05	.08	.05	-.08	.34	.05	.33	.24	.17		.03	-.02	-.04	.05	.07	-.05	.01	.06
-.01	.05	.07	.07	.04	.08	.07	.10	.05	.21	.10	.12	.12		-.05	-.03	-.05	-.06	.10	-.04	-.09
-.06	.00	.00	.04	.05	.14	.23	.15	.16	.05	.10	.04	.13	.36		-.07	-.02	.00	.03	.01	.05
.12	.07	.15	.19	.07	.01	.04	.28	.03	.26	.07	.16	.15	.60	.30		-.06	.06	.13	.02	.06
.10	.09	.25	.23	.13	.04	.18	.19	.26	.01	.01	.00	.12	.45	.61	.42		-.07	.07	-.04	-.01
-.04	-.01	.00	.00	.02	.08	.04	.04	-.06	.19	.01	.10	.00	.59	.26	.77	.31		.08	-.12	.13
.02	.09	.19	.22	.12	-.03	.28	.06	.24	.15	.26	-.01	.05	.45	.61	.49	.58	.34		.03	-.07
-.02	-.02	.04	.03	.02	.06	.08	.16	-.06	.16	.09	.16	.05	.48	.37	.59	.38	.49	.43		.05
-.10	-.13	-.10	-.12	.00	.08	.01	.05	-.10	.03	-.01	.10	.22	.32	.57	.45	.45	.48	.41	.42	

Table B-26

Rotated Factor Loadings of Blood Count Study No. 3
Population = 94

Variable* No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	h^2‡
01	Total Polymorphonuclear Leucocyte Count - Basal Value (P)*	.74	-.01	.08	-.09	-.13	-.16	.02	-.02	0.61
02	Total Polymorphonuclear Leucocyte Count - Pre Stress Value (P)	.85	.23	.02	.04	-.01	.02	-.14	.02	0.80
03	Total Polymorphonuclear Leucocyte Count - Stress Value (P)	.84	.05	-.07	.16	.02	.13	-.15	.14	0.80
04	Total Polymorphonuclear Leucocyte Count - Post Stress Value (P)	.78	-.06	.00	.18	.05	-.03	-.15	.14	0.69
05	Total Polymorphonuclear Leucocyte Count - Basal Value (T)**	.65	.08	.11	.03	.06	.21	.11	-.04	0.50
06	Total Polymorphonuclear Leucocyte Count - Pre Stress Value (T)	.72	-.05	.05	-.09	.72	.01	.01	.04	1.05
07	Total Polymorphonuclear Leucocyte Count - Stress Value (T)	.69	-.07	-.09	-.05	.50	.11	-.19	-.10	0.80
08	Total Polymorphonuclear Leucocyte Count - Post Stress Value (T)	.68	.07	-.07	-.09	.09	.19	.06	-.12	0.54
09	Total Eosinophil Count - Basal Value (P)	-.50	.69	.16	.00	.20	.00	-.06	-.02	0.80
10	Total Eosinophil Count - Pre Stress Value (P)	-.33	.75	.13	-.19	.18	.16	.02	-.05	0.79
11	Total Eosinophil Count - Stress Value (P)	-.51	.73	.18	-.07	.18	-.03	.07	.41	1.04
12	Total Eosinophil Count - Post Stress Value (P)	-.38	.80	.01	-.11	.10	-.01	.05	-.02	0.81
13	Total Eosinophil Count - Basal Value (T)	-.30	.75	.01	-.05	-.05	.08	-.05	-.01	0.67
14	Total Eosinophil Count - Pre Stress Value (T)	-.53	.54	-.17	.10	-.29	.00	.00	.06	0.70
15	Total Eosinophil Count - Stress Value (T)	-.48	.60	.02	.07	-.37	.08	.20	.39	0.93
16	Total Eosinophil Count - Post Stress Value (T)	-.31	.71	.01	-.03	.07	.13	-.25	.04	0.69
17	Total Basophil Count - Basal Value (P)	.08	-.01	.12	.00	.17	.11	-.03	.50	0.31
18	Total Basophil Count - Pre Stress Value (P)	-.15	.30	-.02	.14	-.07	.30	-.08	-.08	0.24
19	Total Basophil Count - Stress Value (P)	-.13	.06	.39	.04	.12	.05	.36	.01	0.32
20	Total Basophil Count - Post Stress Value (P)	-.16	.14	.08	.08	-.02	.30	.43	-.15	0.36
21	Total Basophil Count - Basal Value (T)	-.14	.06	.37	.14	-.23	-.19	-.08	-.02	0.28
22	Total Basophil Count - Pre Stress Value (T)	-.10	.03	.41	.04	.42	-.12	.20	.06	0.42
23	Total Basophil Count - Stress Value (T)	.09	.12	.35	.00	-.11	.00	.29	.15	0.26
24	Total Basophil Count - Post Stress Value (T)	-.14	.05	.82	-.18	.11	.14	-.17	.02	0.79
25	Total Monocyte Count - Basal Value (P)	-.13	.03	.24	.69	.15	-.13	.00	.04	0.59
26	Total Monocyte Count - Pre Stress Value (P)	-.24	-.17	.16	.55	.17	.49	.00	.04	0.69
27	Total Monocyte Count - Stress Value (P)	-.10	.15	.39	.70	.07	-.19	.04	.01	0.72
28	Total Monocyte Count - Post Stress Value (P)	-.40	.02	.10	.62	.23	.28	.10	.04	0.70
29	Total Monocyte Count - Basal Value (T)	.06	.02	.17	.81	.04	-.42	-.01	.09	0.88
30	Total Monocyte Count - Pre Stress Value (T)	-.16	.05	.12	.58	-.22	.48	-.22	-.06	0.71
31	Total Monocyte Count - Stress Value (T)	-.03	.03	.22	.67	-.06	-.07	-.01	.04	0.51
32	Total Monocyte Count - Post Stress Value (T)	.01	-.08	.20	.54	.21	.30	-.23	.00	0.53

* P = Psychological Stress.

** T = Tank Stress.

‡ h^2 = Communalities; underlined communality values need final adjustment to reduce them to 1.00 or less.

Table B-27

Summary of Variables for Blood Count Study No. 4 With Their Means and Standard Deviations
Population = 93

Variable No.	Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01	Leucocyte Count Ratio - Pre Stress/Basal	P*	Percent of Basal Value	87.387	±20.719
02	Leucocyte Count Ratio - Stress/Basal	P	Percent of Basal Value	94.301	±24.904
03	Leucocyte Count Ratio - Post Stress/Basal	P	Percent of Basal Value	97.301	±22.185
04	Leucocyte Count Ratio - Stress/Pre Stress	P	Percent of Pre Stress Value	110.753	±27.129
05	Leucocyte Count Ratio - Post Stress/Pre Stress	P	Percent of Pre Stress Value	108.925	±25.207
06	Leucocyte Count Ratio - Pre Stress/Basal	T**	Percent of Basal Value	84.194	±22.781
07	Leucocyte Count Ratio - Stress/Basal	T	Percent of Basal Value	109.462	±44.489
08	Leucocyte Count Ratio - Post Stress/Basal	T	Percent of Basal Value	113.763	±32.723
09	Leucocyte Count Ratio - Stress/Pre Stress	T	Percent of Pre Stress Value	121.398	±32.909
10	Leucocyte Count Ratio - Post Stress/Pre Stress	T	Percent of Pre Stress Value	131.828	±38.014
11	Lymphocyte Count Ratio - Pre Stress/Basal	P	Percent of Basal Value	75.054	±20.563
12	Lymphocyte Count Ratio - Stress/Basal	P	Percent of Basal Value	89.140	±28.724
13	Lymphocyte Count Ratio - Post Stress/Basal	P	Percent of Basal Value	83.118	±22.045
14	Lymphocyte Count Ratio - Stress/Pre Stress	P	Percent of Pre Stress Value	114.409	±29.383
15	Lymphocyte Count Ratio - Post Stress/Pre Stress	P	Percent of Pre Stress Value	107.312	±26.157
16	Lymphocyte Count Ratio - Pre Stress/Basal	T	Percent of Basal Value	76.989	±42.472
17	Lymphocyte Count Ratio - Stress/Basal	T	Percent of Basal Value	73.118	±22.239
18	Lymphocyte Count Ratio - Post Stress/Basal	T	Percent of Basal Value	78.602	±22.746
19	Lymphocyte Count Ratio - Stress/Pre Stress	T	Percent of Pre Stress Value	98.065	±30.099
20	Lymphocyte Count Ratio -Post Stress/Pre Stress	T	Percent of Pre Stress Value	104.946	±29.095

* P = Psychological Stress.

** T = Tank Stress.

Table B-28

Intercorrelations and Residuals of Variables from Blood Count Study No. 4
Population = 93; Significance Levels: $P = 0.05, |r| \geq 0.21$; $P = 0.01, |r| \geq 0.27$

Residuals

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
01		.08	-.01	-.06	-.03	.01	.03	-.03	-.04	.02	.07	.11	.03	.03	-.05	-.03	.00	.03	-.01	.04
02	.57		-.06	.06	-.08	.01	.00	.04	.02	-.04	.01	-.03	-.03	-.04	-.01	.03	.01	.00	.01	.01
03	.51	.54		-.07	.06	.01	-.01	.04	.03	-.01	.01	-.01	.00	.00	.02	.01	-.01	.00	.01	.03
04	-.43	.46	.04		08	-.03	.04	.07	-.04	.00	.02	.06	-.03	.08	.01	.00	.01	.02	-.01	.00
05	-.47	.02	.48	.53		-.03	-.08	-.01	.08	-.08	-.08	-.07	-.03	.09	.10	.01	.04	-.01	.06	.00
06	.20	.16	.03	-.07	-.19		.00	.07	-.09	-.08	.00	-.06	-.07	-.08	-.06	.02	.07	.04	-.02	-.02
07	.28	.30	.20	-.04	-.07	.26		-.04	.09	-.04	.05	-.05	-.05	-.03	-.04	-.09	.00	-.04	.00	.02
08	-.09	.02	-.14	.05	-.06	.53	.33		.00	.05	-.06	-.01	.01	-.01	-.01	-.09	.04	-.01	.04	-.04
09	-.13	-.23	.08	-.17	.20	-.39	.15	.20		.00	.02	.09	.04	.02	.01	.00	.05	.00	.01	-.07
10	-.23	-.16	-.08	.02	.17	-.40	.10	.49	.72		-.04	-.01	.03	.01	.00	.09	.07	.05	.00	-.09
11	.71	.47	.34	-.27	-.33	.05	.38	-.11	-.21	-.12		.07	.10	.01	-.08	.03	.04	.00	.01	-.04
12	.29	.67	.22	.37	-.03	.00	.25	.03	-.24	-.04	.58		.05	.01	-.06	.01	.00	-.01	.01	-.02
13	.23	.35	.51	.10	.28	-.07	.15	-.05	-.13	.00	.51	.63		-.03	.08	-.01	-.02	-.01	.01	-.01
14	-.38	.29	-.12	.73	.30	-.03	-.08	.08	-.15	.00	-.33	.53	.19		.03	-.01	-.02	-.02	.00	.03
15	-.42	-.05	.22	.39	.65	-.11	-.15	.01	.04	.08	-.43	.06	.50	.53		-.04	-.02	-.03	.02	.00
16	.17	.14	.12	-.03	-.08	.54	.06	.23	-.28	-.25	.05	-.05	.00	-.07	-.04		.00	.06	-.06	.00
17	.19	.06	.08	-.11	-.08	.41	.15	.14	.02	-.28	.03	-.05	-.10	-.09	-.17	.26		.10	.02	.00
18	.02	.17	-.07	.15	-.06	.43	.13	.51	-.13	.01	.02	.17	.01	.19	-.02	.36	.59		-.02	.08
19	.06	-.07	.10	-.15	.05	-.30	-.05	-.25	.41	.05	-.02	-.09	-.08	-.13	-.11	-.33	.53	.09		.10
20	-.08	.00	-.08	.05	.03	-.35	-.04	-.02	.27	.29	.03	.13	.02	.09	-.02	-.33	.16	.42	.65	

Intercorrelations

Table B-29

Rotated Factor Loadings of Blood Count Study No. 4
Population = 93

Variable No.	Description of Variable	Final Factors										h^2‡
		1	2	3	4	5	6	7	8	9	10	
01	Leucocyte Count Ratio - Pre Stress/Basal (P)*	.87	.19	.02	-.03	-.19	.06	-.18	.35	.01	-.04	.99
02	Leucocyte Count Ratio - Stress/Basal (P)	.64	.19	.21	-.01	.00	-.02	.66	.15	.11	.09	.97
03	Leucocyte Count Ratio - Post Stress/Basal (P)	.58	.04	.68	.03	.12	-.11	-.03	.15	.18	.14	.90
04	Leucocyte Count Ratio - Stress/Pre Stress (P)	-.23	.00	.32	-.09	.19	-.03	.67	.01	-.04	.07	.66
05	Leucocyte Count Ratio - Post Stress/Pre Stress (P)	-.26	-.07	.68	.14	.29	-.13	.08	-.13	.08	.09	.69
06	Leucocyte Count Ratio - Pre Stress/Basal (T)**	.06	.73	.02	.22	.02	.12	-.02	.03	-.03	-.14	.62
07	Leucocyte Count Ratio - Stress/Basal (T)	.33	.19	-.02	.46	.02	-.01	.09	-.10	.19	.00	.41
08	Leucocyte Count Ratio - Post Stress/Basal (T)	-.06	.48	-.19	.30	.13	.14	.10	.04	.09	-.06	.97
09	Leucocyte Count Ratio - Stress/Pre Stress (T)	-.05	-.67	.15	.57	-.08	.14	-.16	.15	-.07	-.19	.91
10	Leucocyte Count Ratio - Post Stress/Pre Stress (T)	-.08	-.59	-.09	.71	.06	-.13	.09	.03	-.18	.22	.98
11	Lymphocyte Count Ratio - Pre Stress/Basal (P)	.86	.06	-.19	-.01	-.05	-.07	-.02	-.26	.06	.16	.88
12	Lymphocyte Count Ratio - Stress/Basal (P)	.52	.09	-.19	-.02	.42	-.07	.62	-.18	.19	.10	.96
13	Lymphocyte Count Ratio - Post Stress/Basal (P)	.46	.00	.18	-.04	.65	-.17	.04	-.19	.12	.10	.76
14	Lymphocyte Count Ratio - Stress/ Pre Stress (P)	-.27	.06	-.04	-.08	.55	.03	.73	.15	.03	-.17	.97
15	Lymphocyte Count Ratio - Post Stress/Pre Stress (P)	-.26	-.08	.36	-.03	.72	-.12	.03	.06	-.05	-.04	.75
16	Lymphocyte Count Ratio - Pre Stress/Basal (T)	.06	.62	.19	.10	-.02	.10	-.11	.02	-.16	-.12	.50
17	Lymphocyte Count Ratio - Stress/Basal (T)	.07	.30	.11	.06	-.05	.74	-.13	.02	.38	-.08	.83
18	Lymphocyte Count Ratio - Post Stress/Basal (T)	.00	.38	-.04	.22	.18	.65	.17	-.10	-.15	.24	.77
19	Lymphocyte Count Ratio - Stress/Pre Stress (T)	.08	-.51	.06	-.05	-.09	.64	-.12	.06	.41	-.05	.88
20	Lymphocyte Count Ratio - Post Stress/Pre Stress (T)	.09	-.55	-.14	.05	.13	.58	.13	-.13	-.10	.29	.81

* P = Psychological Stress.

** T = Tank Stress.

‡ h^2 = Communality.

Table B-30

Summary of Variables for Blood Count Study No. 5 With Their Means and Standard Deviations
Population = 93

Variable No.	Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal	P*	Percent of Basal Value	90.323	± 30.496
02	Polymorphonuclear Leucocyte Ratio - Stress/Basal	P	Percent of Basal Value	100.860	± 33.139
03	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal	P	Percent of Basal Value	103.226	± 32.665
04	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal	T**	Percent of Basal Value	93.763	± 30.086
05	Polymorphonuclear Leucocyte Ratio - Stress/Basal	T	Percent of Basal Value	132.581	± 47.404
06	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal	T	Percent of Basal Value	144.624	± 54.012
07	Eosinophil Ratio - Pre Stress/Basal	P	Percent of Basal Value	106.452	± 67.036
08	Eosinophil Ratio - Stress/Basal	P	Percent of Basal Value	119.785	± 81.886
09	Eosinophil Ratio - Post Stress/Basal	P	Percent of Basal Value	119.892	± 96.034
10	Eosinophil Ratio - Pre Stress/Basal	T	Percent of Basal Value	99.032	± 76.889
11	Eosinophil Ratio - Stress/Basal	T	Percent of Basal Value	73.441	± 59.505
12	Eosinophil Ratio - Post Stress/Basal	T	Percent of Basal Value	91.720	± 93.609
13	Basophil Ratio - Pre Stress/Basal	P	Percent of Basal Value	35.376	± 63.204
14	Basophil Ratio - Stress/Basal	P	Percent of Basal Value	54.839	± 86.790
15	Basophil Ratio - Post Stress/Basal	P	Percent of Basal Value	44.194	± 75.425
16	Basophil Ratio - Pre Stress/Basal	T	Percent of Basal Value	49.462	± 84.438
17	Basophil Ratio - Stress/Basal	T	Percent of Basal Value	43.548	± 78.421
18	Basophil Ratio - Post Stress/Basal	T	Percent of Basal Value	54.624	±123.598
19	Monocyte Ratio - Pre Stress/Basal	P	Percent of Basal Value	4.516	± 11.595
20	Monocyte Ratio - Stress/Basal	P	Percent of Basal Value	4.731	± 12.918
21	Monocyte Ratio - Post Stress/Basal	P	Percent of Basal Value	51.075	± 86.974
22	Monocyte Ratio - Pre Stress/Basal	T	Percent of Basal Value	55.806	± 76.106
23	Monocyte Ratio - Stress/Basal	T	Percent of Basal Value	51.290	± 83.540
24	Monocyte Ratio - Post Stress/Basal	T	Percent of Basal Value	71.613	±131.200

* P = Psychological Stress.

** T = Tank Stress.

Table B-31

Intercorrelations and Residuals of Variables from Blood Count Study No. 5
Population = 93; Significance Levels: P = 0.05, $|r| \geq 0.21$; P = 0.01, $|r| \geq 0.27$

Residuals

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
C1		.00	-.03	.08	-.04	-.05	.03	-.05	.03	-.01	.02	-.01	.08	-.05	.04	.02	.08	.01	.01	.02	.01	.01	.02	-.03
02	.60		-.01	.03	-.03	.02	-.06	.09	-.01	.05	-.03	-.01	.05	.08	-.03	.03	.00	-.03	.04	.01	-.06	-.02	-.01	.07
03	.51	.64		-.07	.03	.00	.04	-.04	.02	-.03	-.02	.02	.08	.00	.04	.10	.05	.04	-.01	-.09	.06	.00	.00	-.06
04	.21	.15	.04		-.03	.02	.06	-.07	.01	-.04	.02	.01	.01	-.01	.03	-.08	-.01	.05	-.02	.10	.01	-.06	-.03	-.07
05	.07	.00	.12	.50		.02	.02	.00	.00	.00	.01	-.01	.00	-.01	.01	.01	-.02	.01	.02	-.08	-.01	.00	.02	-.02
06	-.07	-.06	-.02	.41	.78		-.08	.06	.01	.03	-.04	.01	.01	.02	-.03	.04	.04	-.08	.00	-.09	-.01	.00	-.01	.01
07	.01	-.04	-.02	.07	.06	.11		.01	.01	.01	.00	-.01	.05	-.03	.01	.02	-.04	.01	.01	-.10	-.04	-.04	.03	.01
08	-.01	.17	-.02	-.03	.10	.27	.43		.03	-.02	.03	.00	-.09	.10	.02	-.01	.04	-.04	.00	-.09	.04	.03	-.05	.02
09	-.13	-.17	-.19	.07	.23	.40	.44	.49		.03	-.02	.03	.07	-.08	-.03	.07	.07	.02	-.01	.02	-.02	.03	.03	-.02
10	-.16	-.18	-.16	.14	.07	.04	-.11	-.15	-.04		.01	.02	.04	-.04	.02	-.04	-.02	.10	-.01	-.04	-.01	-.01	-.05	.06
11	-.06	-.16	-.07	.16	.01	-.09	-.13	-.09	-.11	.60		.01	.04	-.04	.03	.07	.06	-.08	.03	-.05	-.01	.02	.02	-.03
12	-.06	-.07	.00	.17	-.09	-.10	-.13	-.12	-.09	.60	.66		-.01	.08	-.04	-.03	-.03	.10	-.03	.05	.01	-.01	.04	-.03
13	-.02	.03	.03	-.13	-.18	-.11	-.04	-.17	.02	-.02	.01	-.04		-.01	.05	.04	.04	-.10	.04	-.01	.04	.10	.00	-.08
14	-.20	-.04	-.12	-.03	-.01	.04	-.15	.01	-.11	.01	.04	.14	.21		.05	.00	-.01	.01	.04	.06	.08	-.04	-.01	.05
15	-.10	.03	-.05	.06	-.13	-.06	-.04	-.01	.02	.07	.13	.11	.54	.42		-.04	-.05	.09	-.03	.00	-.04	-.07	.03	.03
16	.04	-.04	.13	.28	.20	.05	-.11	-.06	-.10	.31	.32	.24	-.14	-.06	-.13		.02	.05	-.03	.03	.02	-.01	.03	-.01
17	.05	-.06	.02	.22	-.09	-.12	-.13	-.02	-.09	.33	.36	.32	-.06	-.03	.00	.63		.05	.01	-.06	.01	.02	.01	-.02
18	-.03	-.13	.03	.23	.15	-.06	-.17	-.20	-.13	.37	.18	.35	-.13	.07	.11	.37	.30		.03	-.10	-.02	.02	-.03	.05
19	.02	.03	-.04	-.04	-.02	-.02	.01	-.19	-.09	.00	-.02	-.03	.01	-.12	-.11	-.09	-.05	-.03		.10	.00	.00	-.02	.04
20	.10	.05	.01	.21	.11	.01	-.17	-.11	-.03	.00	-.02	.05	-.05	.06	-.07	.16	-.03	-.03	.05		.03	.05	-.02	-.07
21	.15	.09	.20	.03	.04	.02	-.05	-.15	-.12	.00	-.03	.01	.06	-.07	-.04	-.05	-.10	-.07	.66	.03		.00	.06	-.03
22	-.04	-.17	.04	-.03	.05	-.05	-.15	.05	-.04	.30	.33	.23	.11	.01	-.08	.36	.25	.23	-.16	.18	-.08		.04	.02
23	.06	-.02	.11	-.12	-.14	-.23	-.06	-.12	-.13	.09	.17	.16	-.01	-.07	-.07	.23	.14	.05	.07	.04	.23	.36		.02
24	.03	.02	.12	-.09	.04	-.06	-.12	.03	-.12	.25	.15	.07	-.12	.01	-.16	.34	.12	.21	-.04	.10	.02	.59	.44	

Intercorrelations

Table B-32

Rotated Factor Loadings of Blood Count Study No. 5
Population = 93

Variable No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	h2‡
01	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (P)*	.68	.05	-.02	.01	.11	.00	-.10	.07	.49
02	Polymorphonuclear Leucocyte Ratio - Stress/Basal (P)	.87	-.03	.06	-.01	.10	-.09	.10	.09	.80
03	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (P)	.76	.01	-.04	.06	.11	.14	-.04	.03	.62
04	Polymorphonuclear Leucocyte Ratio - Pre Stress/Basal (T)**	.10	.56	.01	.15	.33	-.13	.05	.05	.48
05	Polymorphonuclear Leucocyte Ratio - Stress/Basal (T)	.08	.96	-.02	-.05	.03	.06	-.07	-.03	.94
06	Polymorphonuclear Leucocyte Ratio - Post Stress/Basal (T)	-.06	.81	.19	-.10	-.13	-.03	.01	.00	.72
07	Eosinophil Ratio - Pre Stress/Basal (P)	-.03	.05	.60	-.17	-.06	-.08	-.05	.10	.41
08	Eosinophil Ratio - Stress/Basal (P)	.07	.10	.67	-.17	.04	.07	.00	-.11	.51
09	Eosinophil Ratio - Post Stress/Basal (P)	-.20	.27	.63	-.16	-.17	-.02	.04	-.01	.57
10	Eosinophil Ratio - Pre Stress/Basal (T)	-.26	.11	-.02	.68	.16	.04	-.04	.01	.57
11	Eosinophil Ratio - Stress/Basal (T)	-.13	.04	.02	.80	.06	.04	.00	-.06	.67
12	Eosinophil Ratio - Post Stress/Basal (T)	-.09	-.03	.03	.80	.13	-.09	.04	.01	.68
13	Basophil Ratio - Pre Stress/Basal (P)	-.04	-.15	-.11	-.02	-.18	.11	.49	.00	.32
14	Basophil Ratio - Stress/Basal (P)	-.13	.03	-.13	.07	-.10	.04	.38	-.20	.24
15	Basophil Ratio - Post Stress/Basal (P)	-.05	-.05	.02	.14	-.05	-.02	.98	.08	.99
16	Basophil Ratio - Pre Stress/Basal (T)	-.14	.18	-.09	.21	.83	.17	-.07	.05	.83
17	Basophil Ratio - Stress/Basal (T)	-.15	-.06	-.01	.31	.65	-.05	.02	.03	.55
18	Basophil Ratio - Post Stress/Basal (T)	-.10	.15	-.20	.28	.23	.07	.01	-.07	.21
19	Monocyte Ratio - Pre Stress/Basal (P)	-.06	-.02	-.14	.00	-.13	-.07	-.14	.73	.60
20	Monocyte Ratio - Stress/Basal (P)	.08	.17	-.09	.03	.09	.18	-.04	-.05	.09
21	Monocyte Ratio - Post Stress/Basal (P)	.13	.07	-.15	.07	-.19	.11	-.07	.85	.82
22	Monocyte Ratio - Pre Stress/Basal (T)	-.11	.02	.02	.32	.23	.59	-.03	-.13	.53
23	Monocyte Ratio - Stress/Basal (T)	.02	-.19	-.05	.19	.13	.43	-.13	.15	.32
24	Monocyte Ratio - Post Stress/Basal (T)	.04	.00	-.03	.19	.20	.79	-.19	-.04	.74

* P = Psychological Stress.

** T = Tank Stress.

‡ h^2 = Communality.

APPENDIX C

Physical Fitness Studies

Figure C-1	Sample of Recording Forms for Physical Fitness Tests
Table C-1	Summary of Navy Step Test Data
Table C-2	Summary of Harvard Step Test Data
Table C-3	Summary of Schneider Index and Hand Dynamometer Data
Table C-4	Summary of Variables for Physical Fitness Study With Their Means and Standard Deviations
Table C-5	Intercorrelations and Residuals of Variables in Physical Fitness Analysis
Table C-6	Rotated Factor Loadings for Physical Fitness Study
-	Summary of Factor Analysis

Figure C-1

Sample of Recording Forms for Physical Fitness Tests

NAVY STEP-UP TEST

No._____ Name __________________

a) Resting pulse ______

20 step-ups in 30 sec. ______

b) Pulse after exer. (5-20 sec) ______

c) Pulse after exer. (105-135) ______

Endurance time ______

Pulse after end. exer. (5-20) ______

Pulse after end. exer. (105-135) ____

Pulse after end. exer. (225-255) ___

b + 2c = C.V.S.

SCHNEIDER INDEX

____

(No.) (Name) (Points)

1. Standing pulse _____ (c) ______
2. Reclining pulse _____ (a) ______
3. Pulse increase _____ (b) ______
4. Standing B. P. _____/______
5. Reclining B. P. _____/______
6. Increase sys. _____ (f) _____
7. Pulse (0-15 sec. X 4) _____
8. Pulse incr. after exer. ____ (d) ___
9. Sec. pulse to (3) _____ (e) _____

TOTAL ________

HARVARD STEP-UP TEST

__________ ____________________ SCORE ________ 1-1-1/2 ____

(No.) (Name)

____________________ sec. 2-2-1/2 ____

(endurance)

____________ /min. ____________ /min. ________ 3-3-1/2 ____

(resting pulse) (05"-20" pulse)

Total ____________________

Table C-1

Summary of Navy Step Test Data

Group No.	Subject No.	Resting Pulse (beats/min)	Pulse After Exercise (5"-20") x 4 (beats/min)	Pulse After Exercise (105"-135") x 2 (beats/min)	Pulse Drop After 2-Minute Rest (beats/min)	Pulse Increase After Exercise (beats/min)	Endurance Time (seconds)	Pulse After Endurance (beats/min)	Pulse Increase After Endurance (beats/min)	Cardio-vascular Score
01	1*	80	104	80	24	24	74	120	40	66
01	2*	74	112	72	40	38	71	160	86	64
01	3*	102	152	112	40	50	204	189	87	94
01	4*	84	120	74	46	36	105	160	76	67
01	5*	108	144	104	40	36	70	156	48	88
01	6*	88	132	94	38	44	108	164	76	80
02	1	68	120	80	40	52	300	152	84	70
02	2	78	136	86	50	58	220	232	154	77
02	3	86	120	84	36	34	135	172	86	72
02	4	88	140	92	48	52	150	180	92	81
02	5*	66	120	60	60	54	225	172	106	60
02	6	94	156	102	54	62	127	176	82	90
03	1	52	116	64	52	64	62	172	120	61
03	2	64	124	66	58	60	300	164	100	64
03	3	88	164	80	84	76	115	176	88	81
03	4	68	108	88	20	40	132	156	88	71
03	5	74	120	76	44	46	207	208	134	68
03	6	92	124	100	24	32	300	172	80	81
04	1	72	128	86	42	56	300	172	100	75
04	2	70	152	90	62	82	175	212	142	83
04	3	86	124	90	34	38	85	216	130	76
04	4*	84	132	100	32	48	75	156	72	83
04	5	88	176	100	76	88	300	200	112	95
04	6	92	136	98	38	44	195	164	72	83
05	1	72	124	84	40	52	300	212	140	73
05	2*	-	-	-	-	-	-	-	-	-
05	3*	-	-	-	-	-	-	-	-	-
05	4	84	124	92	32	40	124	180	96	77
05	5	90	200	90	110	110	250	220	130	95
05	6	92	132	98	34	40	143	200	108	82
06	1	78	100	70	30	22	143	148	70	60
06	2	82	112	82	30	30	300	252	170	69
06	3	80	104	86	18	24	204	172	92	69
06	4	84	116	78	38	32	150	184	100	68
06	5	80	120	70	50	40	200	208	128	65
06	6	68	112	72	40	44	100	140	72	64
07	1*	108	172	108	64	64	300	236	128	95
07	2*	102	124	92	32	22	110	196	94	77
07	3	128	164	132	32	36	300	264	136	107
07	4*	78	140	90	50	62	80	156	78	80
07	5	78	144	92	52	66	125	204	126	82
07	6	72	104	62	42	32	163	172	100	57
08	1	96	200	106	94	104	200	336	240	103
08	2	72	112	86	26	40	222	160	88	71
08	3	100	156	124	32	56	165	276	176	101
08	4	92	132	108	24	40	300	188	96	87
08	5*	96	160	120	40	64	235	276	180	100
08	6*	88	140	114	26	52	238	184	96	92
09	1*	86	152	116	36	66	125	224	138	96
09	2	84	132	108	24	48	270	196	112	87
09	3*	76	124	64	60	48	210	236	160	63
09	4*	64	164	86	78	100	170	168	104	84
09	5	80	136	120	16	56	125	232	152	94
09	6*	58	88	64	24	30	210	164	106	54
10	1	76	128	70	58	52	115	168	92	67
10	2	116	132	130	2	16	185	176	60	98
10	3	98	200	84	116	102	140	336	238	92
10	4	60	132	62	70	72	210	180	120	64

09	4*	64	164	86	78	100	170	168	104	84
09	5	80	136	120	16	56	125	232	152	94
09	6*	58	88	64	24	30	210	164	106	54
10	1	76	128	70	58	52	115	168	92	67
10	2	116	132	130	2	16	185	176	60	98
10	3	98	200	84	116	102	140	336	238	92
10	4	60	132	62	70	72	210	180	120	64
10	5	70	224	82	142	154	124	200	130	97
10	6	78	120	98	22	42	95	268	190	79
11	1	90	156	84	72	66	105	360	270	81
11	2	72	92	70	22	20	125	140	68	58
11	3	78	96	72	24	18	300	232	154	60
11	4*	82	112	86	26	30	55	140	58	71
11	5	76	128	84	44	52	120	276	200	74
11	6	82	124	94	30	42	300	200	118	78
12	1	70	136	80	56	66	220	208	138	74
12	2*	92	132	92	40	40	135	176	84	79
12	3	78	124	86	38	46	255	176	98	74
12	4	86	128	86	42	42	195	200	114	75
12	5	90	132	108	24	42	300	184	94	87
12	6	72	104	88	16	32	190	188	116	70
13	1	76	128	72	56	52	300	224	148	68
13	2	102	124	114	10	22	300	240	138	88
13	3	98	124	104	20	26	70	160	62	83
13	4	98	120	90	30	22	265	236	138	75
13	5	100	144	108	36	44	115	240	140	90
13	6	86	132	90	42	46	145	240	154	78
14	1	74	100	74	26	26	300	296	222	62
14	2	74	112	80	32	38	300	172	98	68
14	3*	-	-	-	-	-	-	-	-	-
14	4	46	128	96	32	82	180	248	202	80
14	5*	32	88	62	26	56	300	160	128	53
14	6*	39	120	80	40	81	185	168	129	70
15	1*	78	160	76	84	82	167	308	230	78
15	2	76	120	76	44	44	170	168	92	68
15	3	76	140	82	58	64	293	240	164	76
15	4	102	132	100	32	30	170	172	70	83
15	5	106	136	96	40	30	160	236	130	82
15	6	74	100	86	14	26	155	160	86	68
16	1	88	188	92	96	100	250	240	152	93
16	2	74	116	78	38	42	[illegible]	156	82	68
16	3*	86	124	76	48	38	120	156	70	69
16	4	100	148	120	28	48	300	252	152	97
16	5	70	104	70	34	34	300	192	122	61
16	6	88	136	106	30	48	300	240	152	87
17	1	76	136	80	56	60	300	228	152	74
17	2	84	132	102	30	48	115	176	92	84
17	3	100	120	96	24	20	224	172	72	78
17	4	92	140	104	36	48	300	212	120	87
17	5	86	132	86	46	46	210	212	126	76
17	6*	90	136	96	40	46	300	240	150	82
18	1*	88	116	102	14	28	123	224	136	80
18	2*	-	-	-	-	-	-	-	-	-
18	3	68	104	82	22	36	300	172	104	67
18	4	62	104	60	44	42	265	264	202	56
18	5	78	132	100	32	54	215	176	98	83
18	6	80	148	92	56	68	105	236	156	83
19	1	56	128	60	68	72	185	248	192	62
19	2	64	112	68	44	48	238	172	108	62
19	3*	76	120	68	52	44	263	268	192	64
19	4*	-	-	-	-	-	-	-	-	-
19	5	98	144	116	28	46	300	192	94	94
19	6	106	148	110	38	42	105	192	86	92
20	1	82	112	66	46	30	150	164	82	61
20	2	80	128	82	46	48	220	176	96	73
20	3*	86	132	96	36	46	200	172	86	81
20	4	92	128	90	38	36	300	172	80	77
20	5	94	148	112	36	54	300	228	134	93
20	6	102	136	106	30	34	280	212	110	87

*Subject not included in analysis.
-Indicates no data.

Table C-2

Summary of Harvard Step Test Data

Group No.	Subject No.	Resting Pulse (beats/min)	Endurance Time in Seconds	Post Exercise Pulse Rate Per Min.	Pulse Increase After Exercise	Pulse (1'-1.5') Post Exercise	Pulse (2'-2.5') Post Exercise	Pulse (3'-3.5') Post Exercise	Total of (1'-1.5', 2'-2.5', 3'-3.5') Post Exercise Pulse Rates	Score
01	1*	78	255	144	66	59	53	52	164	78
01	2*	72	80	200	128	75	60	54	189	21
01	3*	90	300	196	106	75	67	64	206	73
01	4*	78	208	196	118	76	62	62	200	52
01	5*	80	125	172	92	73	67	62	202	31
01	6*	74	134	168	94	77	60	56	193	35
02	1	80	300	220	140	71	70	67	208	72
02	2	80	300	188	108	75	64	60	199	75
02	3	81	300	204	123	70	66	66	192	74
02	4	80	300	184	104	73	68	67	208	72
02	5*	76	300	204	128	70	62	62	194	77
02	6	84	300	188	104	73	69	61	203	74
03	1	76	300	172	96	70	59	57	186	81
03	2	82	300	160	78	55	53	51	159	94
03	3	92	300	184	92	80	64	65	209	72
03	4	98	300	172	74	68	62	57	187	80
03	5	72	300	172	100	68	62	59	189	79
03	6	92	300	172	80	71	66	63	200	75
04	1	92	300	168	76	79	74	70	223	67
04	2	68	300	164	96	67	62	58	187	80
04	3	66	300	180	114	82	74	60	216	69
04	4*	84	300	176	92	74	68	66	208	72
04	5	92	300	184	92	82	74	70	226	66
04	6	92	300	172	80	66	60	57	183	82
05	1	84	300	172	88	68	60	55	183	82
05	2*	-	-	-	-	-	-	-	-	-
05	3*	-	-	-	-	-	-	-	-	-
05	4	116	195	228	112	78	72	67	217	45
05	5	100	300	172	72	73	63	61	197	76
05	6	88	300	220	132	73	65	61	199	75
06	1	84	300	168	84	69	63	59	191	79
06	2	94	300	168	74	60	55	52	167	90
06	3	72	300	152	80	59	59	54	172	87
06	4	82	300	144	62	59	52	50	161	93
06	5	74	310	148	74	57	50	50	157	99
06	6	80	300	216	136	63	55	55	173	87
07	1*	76	300	160	84	64	57	54	175	86
07	2*	66	300	152	86	57	55	50	162	93
07	3	100	300	164	64	66	58	56	180	83
07	4*	80	300	220	140	76	70	64	210	71
07	5	76	300	156	80	56	52	51	159	94
07	6	60	300	220	160	60	54	49	163	92
08	1	82	300	256	174	106	73	65	244	61
08	2	74	300	140	66	53	49	50	152	99
08	3	82	300	184	102	68	61	57	186	81
08	4	82	300	172	90	75	68	64	207	72
08	5*	84	240	256	172	108	92	63	263	46
08	6*	82	300	172	90	74	69	59	202	74
09	1*	90	300	172	82	69	66	64	199	75
09	2	112	300	204	92	71	66	62	199	75
09	3*	92	300	168	76	69	62	59	190	79
09	4*	76	300	252	176	97	74	66	237	63
09	5	90	300	172	82	72	66	61	199	75
09	6*	72	300	164	92	60	57	53	170	88
10	1	84	300	188	104	76	64	61	201	75
10	2	98	270	252	154	93	76	70	239	56
10	3	96	300	172	76	69	63	59	191	79
10	4	66	300	224	158	69	62	61	192	78
10	5	84	300	176	92	74	65	61	200	75
10	6	72	180	276	204	113	66	63	242	37

09	2	112	300	204	92	71	66	62	199	75
09	3*	92	300	168	76	69	62	59	190	79
09	4*	76	300	252	176	97	74	66	237	63
09	5	90	300	172	82	72	66	61	199	75
09	6*	72	300	164	92	60	57	53	170	88
10	1	84	300	188	104	76	64	61	201	75
10	2	98	270	252	154	93	76	70	239	56
10	3	96	300	172	76	69	63	59	191	79
10	4	66	300	224	158	69	62	61	192	78
10	5	84	300	176	92	74	65	61	200	75
10	6	72	180	276	204	113	66	63	242	37
11	1	92	300	360	268	71	67	61	199	75
11	2	74	300	148	74	57	56	50	163	92
11	3	76	300	148	72	49	47	46	142	106
11	4*	94	165	308	214	100	64	59	223	37
11	5	98	300	190	92	66	60	56	182	82
11	6	102	300	196	94	80	78	72	230	65
12	1	72	300	172	100	68	60	52	180	83
12	2*	80	300	176	96	65	58	54	177	85
12	3	72	300	204	132	69	67	59	195	77
12	4	84	300	180	96	68	63	59	190	79
12	5	86	300	220	134	67	75	68	210	71
12	6	70	300	168	98	65	60	54	179	84
13	1	72	300	152	80	59	55	55	169	89
13	2	78	300	184	106	70	64	55	189	79
13	3	74	210	156	82	66	57	55	178	59
13	4	84	300	192	108	74	63	59	196	77
13	5	90	300	172	82	73	69	65	207	72
13	6	84	300	180	96	73	67	62	202	74
14	1	82	300	240	158	80	62	58	200	75
14	2	82	300	172	90	71	66	65	202	74
14	3*	-	-	-	-	-	-	-	-	-
14	4	94	300	288	194	127	82	63	272	55
14	5*	58	300	140	82	56	45	44	145	103
14	6*	76	215	176	100	71	62	56	189	57
15	1*	86	300	276	190	124	110	92	328	46
15	2	90	300	176	86	66	61	62	189	79
15	3	94	300	272	178	107	64	56	227	66
15	4	100	300	172	72	70	64	61	195	77
15	5	90	300	240	150	98	61	56	215	70
15	6	78	300	168	90	63	58	55	176	85
16	1	86	300	272	186	96	66	63	225	67
16	2	76	300	168	92	65	56	52	173	87
16	3*	72	235	236	164	85	77	56	218	54
16	4	94	300	188	94	72	65	64	201	75
16	5	64	300	196	132	97	60	52	209	72
16	6	86	300	172	86	69	61	59	189	79
17	1	80	300	220	140	67	62	56	185	81
17	2	90	263	196	106	76	68	63	207	64
17	3	96	300	216	120	67	62	58	187	80
17	4	82	300	168	86	65	61	57	182	82
17	5	72	300	232	160	78	61	58	197	76
17	6*	104	300	188	84	79	69	67	215	70
18	1*	86	133	248	162	103	82	62	247	27
18	2*	-	-	-	-	-	-	-	-	-
18	3	78	300	160	82	59	56	55	170	88
18	4	90	300	208	118	79	71	63	213	70
18	5	86	300	168	82	69	62	59	190	79
18	6	84	300	172	88	65	57	54	176	85
19	1	84	205	168	84	90	80	58	228	45
19	2	80	300	180	100	69	60	57	186	81
19	3*	62	300	212	150	85	64	56	205	73
19	4*	-	-	-	-	-	-	-	-	-
19	5	84	300	184	100	74	69	64	207	72
19	6	96	300	208	112	81	71	67	219	68
20	1	60	300	228	168	61	58	56	175	86
20	2	56	300	176	120	62	57	55	174	86
20	3*	78	300	160	82	60	58	57	175	86
20	4	72	300	156	84	66	60	55	181	83
20	5	80	300	160	80	63	60	56	179	84
20	6	80	300	172	92	70	62	60	192	78

*Subject not included in analysis.

- Indicates no data.

Table C-3

Summary of Schneider Index and Hand Dynamometer Data

Group No.	Subject No.	Schneider Score	Standing Pulse beats/min	Reclining Pulse beats/min	Pulse Increase	Standing Systolic Blood Pressure mm Hg	Standing Diastolic Blood Pressure mm Hg	Reclining Systolic Blood Pressure mm Hg	Reclining Diastolic Blood Pressure mm Hg	Standing Pulse Pressure mm Hg	Reclining Pulse Pressure mm Hg	Change In Pulse Pressure mm Hg	Increase In Systolic Blood Pressure mm Hg	Increase In Diastolic Blood Pressure mm Hg	Pulse Per Minute After Exercise	Pulse Increase After Exercise	Seconds For Pulse To Return To Normal	Right Hand: Hand Dynamometer #1	Right Hand: Hand Dynamometer #2	Left Hand: Hand Dynamometer #1	Left Hand: Hand Dynamometer #2	Body Surface Area Square Meters
01	1*	10	88	66	22	90	68	106	68	22	38	16	16	0	96	8	50	49	-	59	-	-
01	2*	16	72	57	15	113	80	104	70	33	34	1	9	10	84	12	40	62	-	61	-	1.985
01	3*	11	92	81	11	120	68	104	54	52	50	2	16	14	100	8	30	45	-	45	-	1.742
01	4*	4	104	72	32	98	50	110	70	48	40	8	12	20	116	12	0	52	-	47	-	1.663
01	5*	7	100	69	31	116	84	124	88	32	36	4	8	4	108	8	45	44	-	45	-	1.892
01	6*	11	100	69	31	110	75	114	84	35	30	5	4	9	104	4	15	56	-	50	-	1.839
02	1	0	116	75	41	106	78	116	70	28	46	18	10	8	132	16	45	46	-	45	-	1.746
02	2	-2	120	72	48	118	96	127	75	22	52	30	9	21	136	16	105	50	-	45	-	1.763
02	3	2	124	90	34	96	68	100	62	28	38	10	4	6	128	4	15	47	-	48	-	1.837
02	4	8	100	69	31	94	64	117	75	30	42	12	23	11	104	4	30	45	-	49	-	1.754
02	5*	7	104	66	38	108	84	110	64	24	46	22	2	20	108	4	15	43	-	48	-	1.871
02	6	3	112	75	37	114	80	118	80	34	38	4	4	0	120	8	45	49	-	43	-	1.768
03	1	16	76	54	22	108	72	104	70	36	34	2	4	2	80	4	15	46	-	43	-	1.881
03	2	13	56	57	1	98	70	98	65	28	33	5	0	5	92	36	45	43	-	40	-	1.539
03	3	13	88	69	19	100	80	100	70	20	30	10	0	10	92	4	30	44	-	45	-	1.934
03	4	16	80	60	20	128	90	114	72	38	42	4	14	18	96	16	15	48	-	46	-	1.696
03	5	14	76	54	22	106	62	104	72	44	32	12	2	10	100	24	30	49	-	45	-	1.856
03	6	13	88	66	22	135	85	125	75	50	50	0	10	10	108	20	45	46	-	51	-	1.825
04	1	8	88	69	19	112	75	120	65	37	55	18	8	10	112	24	35	33	-	41	-	1.713
04	2	15	84	54	30	120	82	112	78	38	34	4	8	4	84	0	0	38	-	42	-	1.783
04	3	18	72	60	12	122	88	114	76	34	38	4	8	12	76	4	15	50	-	52	-	1.930
04	4*	14	84	54	30	100	75	96	55	25	41	16	4	20	88	4	15	44	-	48	-	1.857
04	5	7	100	84	16	143	90	142	82	53	60	7	1	8	128	28	15	47	-	41	-	1.843
04	6	13	88	66	22	105	80	105	65	25	40	15	0	15	96	8	15	42	-	45	-	1.838
05	1	10	88	72	16	102	78	118	78	24	40	16	16	0	100	12	15	47	-	45	-	1.861
05	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05	3*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
05	4	9	100	78	22	114	84	114	68	30	46	16	0	16	104	4	15	44	-	46	-	1.754
05	5	17	68	69	1	112	80	108	75	32	33	1	4	5	76	8	15	45	-	48	-	1.677
05	6	4	104	81	23	96	72	110	80	24	30	6	14	8	104	0	0	51	-	51	-	2.004
06	1	3	108	81	27	106	72	118	68	34	50	16	12	4	116	8	15	49	-	42	-	1.848
06	2	10	96	87	9	115	85	110	80	30	30	0	5	5	112	16	15	44	-	43	-	1.926
06	3	6	104	78	26	102	78	124	76	24	48	24	22	2	108	4	15	44	-	41	-	1.804
06	4	10	96	78	18	108	80	104	65	28	39	11	4	15	108	12	45	34	-	30	-	1.738
06	5	10	96	75	21	108	76	104	62	32	42	10	4	14	104	8	30	40	-	45	-	1.784
06	6	8	100	84	16	112	80	115	68	32	47	15	3	12	100	0	0	33	-	31	-	1.615
07	1*	9	104	66	38	118	85	112	80	33	32	1	6	5	96	8	0	54	-	48	-	1.823
07	2*	12	80	63	17	108	80	118	78	28	40	12	10	2	92	12	15	48	-	44	-	1.852
07	3	12	80	69	11	118	96	120	70	22	50	28	2	26	108	28	30	45	-	48	-	1.763
07	4*	15	72	57	15	120	95	115	80	25	35	10	5	15	100	28	30	44	-	42	-	2.166
07	5	11	80	57	23	104	80	110	72	24	38	14	6	8	96	16	60	43	-	42	-	1.960
07	6	17	56	51	5	108	80	100	60	28	40	12	8	20	72	16	45	32	-	42	-	1.649
08	1	6	112	78	34	118	92	116	72	26	44	18	2	20	120	8	45	43	-	48	-	2.064
08	2	8	92	75	17	120	85	125	75	35	50	15	5	10	108	16	45	45	-	42	-	1.842
08	3	5	104	78	26	102	70	118	70	32	48	16	16	0	120	16	15	42	-	43	-	1.768
08	4	3	112	81	31	125	85	114	75	40	39	1	11	10	124	12	45	42	-	40	-	1.785
08	5*	8	104	78	26	144	78	136	72	66	64	2	8	6	120	16	45	54	-	54	-	2.144
08	6*	4	108	69	39	98	85	104	55	13	49	36	6	30	120	12	45	47	-	44	-	1.720
09	1*	10	96	72	24	118	80	110	65	38	45	7	8	15	108	12	15	48	-	46	-	1.840
09	2	4	104	72	32	110	78	120	62	32	58	26	10	16	120	16	30	40	-	41	-	1.807
09	3*	10	88	69	19	110	82	126	68	28	58	30	16	14	100	12	15	40	-	38	-	1.708
09	4*	11	88	69	19	120	80	130	70	40	60	20	10	10	96	8	15	47	-	53	-	2.001
09	5	7	96	69	27	100	78	110	70	22	40	18	10	8	108	12	15	49	-	44	-	1.875
09	6*	8	96	60	36	100	78	108	70	22	38	16	8	8	104	8	15	41	-	42	-	1.732
10	1	13	80	60	20	116	80	114	60	36	54	18	2	20	108	28	45	45	-	44	-	2.059
10	2	10	100	75	25	122	85	120	65	37	55	18	2	20	108	8	15	57	-	53	-	1.817
10	3	5	112	78	34	114	70	118	80	44	38	6	4	10	120	8	15	47	-	47	-	1.782
10	4	13	76	51	25	110	80	110	65	30	45	15	0	15	100	24	30	43	-	54	-	1.868
10	5	8	96	48	48	106	85	108	70	21	38	17	2	15	112	16	15	49	-	40	-	2.014
10	6	12	72	57	15	105	80	108	65	25	43	18	3	15	100	28	45	52	-	52	-	1.939

09	2	4	104	72	32	110	78	120	62	32	58	26	10	16	120	16	30	40	-	41	-	1.807
09	3*	10	88	69	19	110	82	126	68	28	58	30	16	14	100	12	15	40	-	38	-	1.708
09	4*	11	88	69	19	120	80	130	70	40	60	20	10	10	96	8	15	47	-	53	-	2.001
09	5	7	96	69	27	100	78	110	70	22	40	18	10	8	108	12	15	49	-	44	-	1.875
09	6*	8	96	60	36	100	78	108	70	22	38	16	8	8	104	8	15	41	-	42	-	1.732
10	1	13	80	60	20	116	80	114	60	36	54	18	2	20	108	28	45	45	-	44	-	2.059
10	2	10	100	75	25	122	85	120	65	37	55	18	2	20	108	8	15	57	-	53	-	1.817
10	3	5	112	78	34	114	70	118	80	44	38	6	4	10	120	8	15	47	-	47	-	1.782
10	4	13	76	51	25	110	80	110	65	30	45	15	0	15	100	24	30	43	-	54	-	1.868
10	5	8	96	48	48	106	85	108	70	21	38	17	2	15	112	16	15	49	-	40	-	2.014
10	6	12	72	57	15	105	80	108	65	25	43	18	3	15	100	28	45	52	-	52	-	1.939
11	1	8	96	78	18	134	75	132	60	59	72	13	2	15	112	18	120	44	-	40	-	1.743
11	2	9	92	66	26	100	76	112	68	24	44	20	12	8	96	4	15	53	-	56	-	1.822
11	3	10	96	72	24	104	74	102	60	30	42	12	2	14	96	0	0	46	-	48	-	1.804
11	4*	9	92	72	20	134	85	132	75	49	57	8	2	10	94	2	45	57	-	58	-	2.159
11	5	6	92	69	23	106	86	136	64	20	72	52	30	22	116	24	45	57	-	55	-	2.009
11	6	4	112	84	28	112	85	112	70	27	42	15	0	15	116	4	30	50	-	56	-	1.847
12	1	6	100	69	31	102	76	110	78	26	32	6	8	2	116	16	45	49	-	37	-	1.782
12	2*	4	100	72	28	94	68	110	70	26	40	14	16	2	112	12	[illegible]	57	-	51	-	1.807
12	3	13	80	66	14	140	90	136	75	50	61	11	4	15	112	32		45	-	38	-	2.049
12	4	6	100	75	25	118	86	126	82	32	44	12	8	4	116	16	15	51	-	48	-	2.029
12	5	7	96	69	27	108	80	116	85	28	31	3	8	5	108	12	30	45	-	40	-	1.649
12	6	14	76	60	16	90	62	118	72	28	46	18	28	10	80	4	15	52	-	49	-	1.705
13	1	11	84	54	30	100	75	108	75	25	33	8	8	0	92	8	30	37	-	36	-	1.704
13	2	6	108	69	39	106	82	116	66	24	50	26	10	16	108	0	0	54	-	54	-	1.937
13	3	4	104	66	38	115	85	122	60	30	62	32	7	25	120	16	45	49	-	45	-	2.029
13	4	15	84	78	6	112	86	104	72	26	32	6	8	14	92	8	45	54	-	52	-	1.700
13	5	10	92	66	26	128	88	128	68	40	60	20	0	20	108	16	30	60	-	54	-	1.981
13	6	7	100	75	25	115	85	120	80	30	40	10	5	5	112	12	15	47	-	51	-	1.729
14	1	9	84	72	12	116	78	120	80	38	40	2	4	2	104	20	30	50	57	55	57	1.912
14	2	11	88	78	10	122	85	126	80	37	46	9	4	5	108	20	45	29	34	33	42	1.646
14	3*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	4	6	92	72	20	128	90	134	88	38	46	8	6	2	108	16	15	36	38	39	37	1.705
14	5*	14	56	42	14	124	80	126	70	44	56	12	2	10	80	24	30	44	48	45	45	1.785
14	6*	15	76	66	10	116	92	116	80	24	36	12	0	12	96	20	30	43	47	45	47	1.814
15	1*	10	84	57	29	106	85	112	65	21	47	26	6	20	100	16	30	54	48	50	48	1.884
15	2	17	68	57	11	124	94	110	80	30	30	0	14	14	96	28	30	37	38	37	35	1.812
15	3	18	68	51	17	119	95	108	70	24	38	14	11	25	80	12	30	54	56	54	56	2.044
15	4	7	96	72	24	106	92	126	88	14	38	24	20	4	104	8	15	41	46	51	46	1.809
15	5	10	88	69	19	106	80	114	65	26	49	23	8	15	104	16	30	52	48	49	46	1.845
15	6	14	76	54	22	116	82	116	74	34	42	8	0	8	88	12	15	57	51	53	51	1.957
16	1	3	112	81	31	110	82	114	72	28	42	14	4	10	120	8	15	41	41	40	42	1.848
16	2	11	88	75	13	106	80	110	75	26	35	9	4	5	100	12	30	35	33	34	42	1.588
16	3*	11	84	69	15	114	86	124	68	28	56	28	10	18	100	16	30	35	36	39	40	1.664
16	4	6	96	69	27	115	90	110	65	25	45	20	5	25	112	16	120	54	64	59	63	2.125
16	5	12	84	57	27	110	88	106	58	22	48	26	4	30	92	12	15	45	42	46	43	1.744
16	6	11	96	69	27	125	88	120	75	37	45	8	5	13	100	4	30	59	66	64	67	2.054
17	1	16	80	60	20	120	90	110	70	30	40	10	10	20	96	16	15	47	46	48	42	1.756
17	2	11	80	60	20	114	90	122	80	24	42	18	8	10	96	16	45	46	46	49	49	1.802
17	3	13	80	72	8	116	72	118	70	44	48	4	2	2	96	16	30	45	45	44	45	1.770
17	4	9	76	54	22	122	85	124	75	37	49	12	2	10	88	12	120	54	53	50	48	1.746
17	5	12	76	51	25	92	64	108	64	28	44	16	16	0	88	12	15	48	48	48	47	1.866
17	6*	8	92	66	26	120	80	136	84	40	52	12	16	4	112	20	15	51	45	55	54	1.933
18	1*	5	92	84	8	116	74	116	72	42	44	2	0	2	112	20	120	52	51	57	60	1.889
18	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	3	8	104	75	29	110	76	108	60	34	48	14	2	16	104	0	15	40	42	43	41	1.589
18	4	13	84	54	30	122	84	114	68	38	46	8	8	16	100	16	60	54	62	56	60	1.982
18	5	3	104	84	20	114	86	116	72	28	44	16	2	14	120	16	60	54	58	57	62	2.011
18	6	4	100	72	28	112	80	122	78	32	44	12	10	2	120	20	45	54	55	52	51	1.943
19	1	14	64	51	13	118	80	118	70	38	48	10	0	10	88	24	45	48	48	45	46	1.905
19	2	13	80	57	23	102	75	116	60	27	56	29	14	15	88	8	30	59	69	65	67	2.023
19	3*	15	80	54	26	98	65	98	62	33	36	3	0	3	84	4	15	34	34	34	37	1.614
19	4*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	5	10	92	63	29	116	88	108	70	28	38	10	8	18	116	24	30	42	47	39	47	1.653
19	6	10	88	72	16	128	88	136	72	40	64	24	8	16	100	12	30	54	56	48	49	2.105
20	1	8	104	66	38	112	78	108	70	34	38	4	4	8	112	8	45	49	54	48	51	1.983
20	2	10	92	63	29	118	85	118	50	33	68	35	0	35	88	4	0	46	42	41	42	1.839
20	3*	10	92	75	17	115	75	116	65	40	51	11	1	10	108	16	15	51	55	46	42	1.844
20	4	7	100	84	16	122	80	124	76	42	48	6	2	4	108	8	45	53	48	48	42	1.767
20	5	8	100	75	25	106	74	102	70	32	32	0	4	4	112	12	45	54	53	53	48	1.853
20	6	10	92	69	23	119	85	120	70	34	50	16	1	15	108	16	30	51	46	44	45	1.761

* Subject not included in analysis.
\- Indicates no data.

Table C-5

Intercorrelations and Residuals of Variables in Physical Fitness Ana
Population = 109; Significance Levels: P = 0.05, |r| ≥ 0.19; P = 0.01, |

Residuals

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22
01		-.05	.08	.02	-.06	.00	.01	-.01	-.04	-.03	-.01	.09	.04	-.02	.02	.01	.01	.05	.05	.04	.05	.08
02	.42		-.13	-.12	.10	.12	-.07	-.01	.00	-.04	.01	-.05	.01	.00	-.02	-.08	.03	-.11	.05	-.03	-.02	.05
03	.72	.43		.06	-.12	.06	-.04	-.01	-.03	-.01	.01	.04	.00	.01	.04	-.04	.02	.00	-.03	.03	.03	.05
04	.02	-.04	.06		.15	.01	-.06	.08	.00	-.03	.02	-.07	-.04	.02	-.02	-.05	.02	-.02	.04	-.04	.07	-.05
05	.26	.44	.21	.16		-.02	-.02	-.01	-.02	-.03	.05	.03	-.07	.00	.00	-.01	-.04	-.07	.07	.00	-.03	.03
06	.70	.79	.90	.02	.36		-.02	-.02	.02	-.01	.05	.05	.06	.00	.02	-.07	.02	-.01	-.08	.09	.04	.06
07	.35	.31	.41	.01	.22	.44		-.03	.08	-.04	.00	-.07	.04	-.07	.01	-.07	.01	-.01	.05	-.04	.03	.02
08	.03	.11	-.07	.31	.03	.00	-.09		.04	-.02	.01	-.02	.08	.07	-.01	.01	.03	.03	.02	-.01	.04	-.03
09	.05	.18	.05	-.16	.35	.13	.19	-.30		.06	-.06	.03	.02	.03	-.02	-.03	.02	-.05	.04	.09	.07	.07
10	-.05	.09	-.06	-.18	.27	.00	-.09	-.31	.96		-.07	.01	-.02	.03	.00	-.05	.07	-.02	.00	.04	-.01	.05
11	.03	.29	.17	-.11	.35	.26	.24	-.39	.71	.67		.01	.00	-.04	.05	-.03	-.01	-.01	-.06	-.03	.02	.00
12	.13	.32	.27	-.08	.27	.34	.35	-.28	.52	.45	.76		.08	-.07	.02	-.04	.00	-.01	-.05	.03	-.04	.07
13	.21	.39	.30	-.05	.18	.40	.47	-.08	.42	.31	.58	.84		-.09	.02	-.04	.02	-.06	.07	.04	-.01	.05
14	-.09	-.22	-.25	.23	-.18	-.28	-.34	.73	-.61	-.55	-.83	-.79	-.64		-.05	.02	.01	.02	.05	-.04	.03	-.05
15	-.10	-.10	-.04	-.07	-.07	-.08	.02	-.23	.06	.07	.16	.15	.09	-.26		.02	-.00	.00	.04	.01	-.02	-.03
16	.35	.22	.35	.03	.11	.34	.21	.08	.02	-.03	.00	.14	.22	-.06	-.04		.03	.10	.08	-.04	-.03	-.05
17	-.29	-.22	-.30	-.06	-.15	-.31	-.21	-.04	-.04	.02	-.02	-.12	-.19	.05	.05	-.92		-.08	-.10	-.02	-.05	-.03
18	.39	.10	.34	.04	.08	.29	.36	-.05	.07	-.03	.01	.11	.16	-.09	.02	.74	-.71		-.09	-.07	-.10	.02
19	-.16	-.01	-.15	-.03	-.03	-.11	-.25	.06	-.11	-.04	-.04	-.06	-.09	.06	.01	-.58	.58	-.82		-.02	.10	-.06
20	.09	.15	.20	.12	.13	.22	.22	-.17	.24	.18	.25	.28	.20	-.29	.04	-.05	.00	.11	-.11		.13	.00
21	.10	.17	.22	.09	.04	.23	.24	-.06	.09	.02	.22	.18	.17	-.21	.00	-.04	.00	-.01	.09	.59		-.03
22	.10	.10	.23	.00	.13	.21	.26	-.14	.20	.12	.20	.28	.20	-.26	.02	.14	-.15	.25	-.15	.64	.34	
23	.04	.16	.14	.06	.06	.18	.19	.02	-.05	-.12	.05	.11	.09	-.07	.04	.04	-.05	.02	-.20	.28	.25	.40
24	.03	.04	.06	.07	.13	.07	.06	-.16	.22	.21	.12	.19	.10	-.18	.05	-.03	.00	.15	-.21	.73	-.12	.50
25	.08	-.02	.12	-.04	.08	.08	.12	-.15	.23	.22	.17	.20	.13	-.21	-.01	.11	-.11	.11	.00	.44	.15	.70
26	.30	.25	.37	.09	.16	.38	.31	.01	.06	-.02	.06	.22	.30	-.15	-.05	.81	-.76	.66	-.52	.13	.10	.31
27	.08	.04	.11	.02	.20	.09	.08	-.26	.19	.18	.10	.12	.06	-.20	.02	.00	-.04	.04	-.05	.22	.13	.14
28	-.24	-.20	-.27	-.06	-.03	-.28	-.19	-.11	.00	.03	-.02	-.12	-.20	.04	.10	-.89	.84	-.48	.40	.13	.04	-.01
29	.02	.02	-.02	.12	.06	.00	-.02	-.04	.08	.08	.03	.00	-.02	-.03	.00	-.24	.16	-.13	.05	.46	.24	-.29
30	-.17	-.14	-.33	-.05	-.08	-.30	-.16	.03	-.06	-.01	-.03	-.16	-.17	.11	.09	-.53	.50	-.43	.34	-.18	-.12	-.26
31	-.10	-.04	-.14	-.02	-.19	-.11	-.04	.29	-.14	-.14	-.07	-.09	-.01	.18	-.02	-.09	.12	-.10	.10	-.18	-.08	-.12
32	-.24	-.16	-.30	-.04	-.10	-.28	-.19	.01	-.04	.01	-.02	-.13	-.18	.08	.08	-.87	.85	-.65	.58	.12	.08	-.25
33	.28	.09	.30	-.05	.20	.25	.14	-.12	.07	.02	.14	.14	.12	-.17	-.06	.12	-.10	.00	.02	.11	.04	.19
34	.18	.00	.22	.03	.20	.15	.20	-.18	.15	.08	.22	.18	.17	-.24	-.08	.03	-.03	-.03	.05	.08	.07	.12
35	.11	.19	.16	-.23	.15	.20	.11	-.18	.20	.18	.27	.19	.18	-.28	-.10	.06	-.02	-.06	.04	.28	.24	.26

Intercorrelations

1

Table C-5

correlations and Residuals of Variables in Physical Fitness Analysis.
tion = 109; Significance Levels: P = 0.05, |r| ≥ 0.19; P = 0.01, |r| ≥ 0.25

Residuals

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
.09	.04	-.02	.02	.01	.01	.05	.05	.04	.05	.08	.08	-.04	.00	.04	-.05	.01	-.01	.05	.02	-.01	.04	.01	-.02
.05	.01	.00	-.02	-.08	.03	-.11	.05	-.03	-.02	.05	.03	-.01	.00	-.02	-.02	.09	-.04	.07	.03	.02	-.01	-.07	.03
.04	.00	.01	.04	-.04	.02	.00	-.03	.03	.03	.05	.00	-.01	.01	.02	-.03	.01	.06	-.05	.02	.00	.02	.04	-.05
.07	-.04	.02	-.02	-.05	.02	-.02	.04	-.04	.07	-.05	-.05	-.04	.02	-.01	.06	-.02	.08	.04	-.01	-.01	.06	.14	-.18
.03	-.07	.00	.00	-.01	-.04	-.07	.07	.00	-.03	.03	.07	.01	-.07	.03	.00	.08	.05	.03	-.01	.04	.02	.01	-.02
.05	.06	.00	.02	-.07	.02	-.01	-.08	.09	.04	.06	.05	.06	-.01	.02	-.05	.06	.11	-.02	.03	.04	.02	.04	.01
.07	.04	-.07	.01	-.07	.01	-.01	.05	-.04	.03	.02	-.05	-.09	.02	.02	.02	.01	.02	.06	.06	.02	-.01	.04	-.06
.02	.08	.07	-.01	.01	.03	.03	.02	-.01	.04	-.03	.05	.07	.00	.01	-.02	.01	.03	.03	.02	.05	.06	.03	-.01
.03	.02	.03	-.02	-.03	.02	-.05	.04	.09	.07	.07	.03	-.03	-.04	.00	-.02	.07	.08	-.02	.00	.06	-.04	-.03	-.01
.01	-.02	.03	.00	-.05	.07	-.02	.00	.04	-.01	.05	.03	.01	.01	-.07	-.02	.15	-.02	.02	.01	.07	-.01	-.02	.01
.01	.00	-.04	.05	-.03	-.01	-.01	-.06	-.03	.02	.00	-.04	-.10	-.04	-.01	.01	.07	-.02	.02	.03	.01	-.06	-.04	-.06
	.08	-.07	.02	-.04	.00	-.01	-.05	.03	-.04	.07	-.01	.00	.00	-.03	.10	.09	.06	.00	.02	.04	.04	.02	-.05
.84		-.09	.02	-.04	.02	-.06	.07	.04	-.01	.05	.01	.00	-.01	.02	.06	.07	.01	.02	.04	.04	.01	.01	-.02
.79	-.64		-.05	.02	.01	.02	.05	-.04	.03	-.05	.06	.01	-.02	.00	-.01	-.04	-.03	.02	-.03	-.01	.02	-.01	.01
.15	.09	-.26		.02	.00	.00	.04	.01	-.02	.03	-.01	.02	.02	-.04	-.01	.03	.00	.06	.02	.05	.08	.03	-.03
.14	.22	-.06	-.04		.03	.10	.08	-.04	-.03	-.05	-.03	-.04	.06	-.05	-.01	-.02	.07	.14	-.03	-.01	.03	.05	-.08
.12	-.19	.05	.05	-.92		-.08	-.10	-.02	-.05	-.03	-.01	.05	-.11	.06	.00	.01	-.09	-.14	.02	.03	-.02	-.05	.10
.11	.16	-.09	.02	.74	-.71		-.09	-.07	-.10	.02	-.06	-.08	-.06	.06	-.06	-.06	-.05	.04	.04	-.12	.02	.00	-.09
.06	-.09	.06	.01	-.58	.58	-.82		-.02	.10	-.06	-.09	-.09	-.06	.07	.03	-.06	.04	-.11	.02	.03	-.04	.03	.05
.28	.20	-.29	.04	-.05	.00	.11	-.11		.13	.00	-.08	.01	.10	.00	.08	-.02	.04	.00	.01	-.06	.05	-.01	.04
.18	.17	-.21	.00	-.04	.00	-.01	.09	.59		-.03	.00	-.14	-.03	.00	-.08	.01	-.06	-.01	.03	.00	.00	.02	.09
.28	.20	-.26	.02	.14	-.15	.25	-.15	.64	.34		.17	.11	-.01	.01	-.01	.02	-.15	.02	.00	-.03	.05	.02	.04
.11	.09	-.07	.04	.04	-.05	.02	-.20	.28	.25	.40		.11	-.08	.02	.02	.02	-.04	.06	.03	-.05	.08	.05	-.09
.19	.10	-.18	.05	-.03	.00	.15	-.21	.73	-.12	.50	.13		-.03	-.03	.11	-.03	.07	.04	.06	-.06	-.01	-.09	-.01
.20	.13	-.21	-.01	.11	-.11	.11	.00	.44	.15	.70	-.37	.41		.07	-.02	-.10	-.09	-.09	.02	-.08	-.03	-.04	.10
.22	.30	-.15	-.05	.81	-.76	.66	-.52	.13	.10	.31	.12	.08	.22		.00	.05	.00	-.11	.06	-.03	.05	.00	.00
.12	.06	-.20	.02	.00	-.04	.04	-.05	.22	.13	.14	-.04	.16	.18	.23		.05	-.03	.00	-.03	.07	.03	.02	.02
.12	-.20	.04	.10	-.89	.84	-.48	.40	.13	.04	-.01	.05	.12	-.05	-.68	.06		-.03	-.09	.01	.07	-.04	-.08	.08
.00	-.02	-.03	.00	-.24	.16	-.13	.05	.46	.24	-.29	-.14	.36	-.19	-.24	.07	.21		-.06	-.02	-.04	.01	-.03	.07
.16	-.17	.11	.09	-.53	.50	-.43	.34	-.18	-.12	-.26	-.01	-.11	-.25	-.76	-.21	.47	.08		-.03	.02	-.04	.02	.01
.09	-.01	.18	-.02	-.09	.12	-.10	.10	-.18	-.08	-.12	.06	-.15	-.16	-.23	-.93	.02	-.07	.23		-.04	-.01	.00	.02
.13	-.18	.08	.08	-.87	.85	-.65	.58	.12	.08	-.25	-.08	.08	-.20	-.84	-.22	.83	.50	.63	.29		-.03	-.03	.07
.14	.12	-.17	-.06	.12	-.10	.00	.02	.11	.04	.19	.02	.09	.18	.08	.17	-.14	-.02	-.14	-.16	-.14		.01	.02
.18	.17	-.24	-.08	.03	-.03	-.03	.05	.08	.07	.12	-.02	.03	.14	-.05	.16	-.08	.05	.00	-.15	-.03	.79		.03
.19	.18	-.28	-.10	.06	-.02	-.06	.04	.28	.24	.26	.04	.14	.23	.11	.11	-.06	.08	-.13	-.08	-.04	.58	.56	

Table C-4

Summary of Variables for Physical Fitness Study With Their Means and Standard Deviations
Population = 109

Variable No.	Description of Variable	Unit of Measurement	Mean	Standard Deviation
01	Resting Pulse (N)	Beats per Minute	81.9	±14.7
02	Pulse 5-20 Seconds after Exercise (N)	Beats per Minute	32.9 (131.6)*	± 5.9 (23.6)
03	Pulse 105-135 Seconds after Exercise (N)	Beats per Minute	44.5 (89.0)*	± 8.2 (16.4)
04	Endurance Time (N)	Seconds	199.2	±77.4
05	Pulse 5-20 Seconds after Endurance (N)	Beats per Minute	50.1 (200.5)*	±10.9 (43.7)
06	Cardiovascular Score (N)	-	77.4	±12.0
07	Resting Pulse (H)	Beats per Minute	82.6	±10.9
08	Endurance Time (H)	Seconds	291.0	±29.9
09	Pulse 5-20 Seconds after Endurance (H)	Beats per Minute	47.1 (188.3)*	± 9.6 (38.5)
10	Pulse Increase after Endurance (H)	Beats per Minute	105.7	±37.6
11	Pulse 1.0-1.5 Minutes after Endurance (H)	Beats per Minute	73.3 (146.6)*	±14.2 (28.4)
12	Pulse 2.0-2.5 Minutes after Endurance (H)	Beats per Minute	64.0 (128.0)*	± 8.7 (17.4)
13	Pulse 3.0-3.5 Minutes after Endurance (H)	Beats per Minute	59.2 (118.4)*	± 6.3 (12.6)
14	Harvard Score (H)	-	75.5	±13.3
15	Age	Months	227.5	±18.1
16	Standing Pulse (S)	Beats per Minute	91.0	±13.5
17	Points for Standing Pulse (S)	-	1.6	± 1.0
18	Reclining Pulse (S)	Beats per Minute	68.0	± 9.9
19	Points for Reclining Pulse (S)	-	2.5	± 0.7
20	Standing Systolic Blood Pressure (S)	Millimeters of Mercury	112.8	±10.6
21	Standing Diastolic Blood Pressure (S)	Millimeters of Mercury	81.1	± 7.3
22	Reclining Systolic Blood Pressure (S)	Millimeters of Mercury	115.7	± 9.4
23	Reclining Diastolic Blood Pressure (S)	Millimeters of Mercury	70.8	± 7.2
24	Standing Pulse Pressure (S)	Millimeters of Mercury	31.7	± 8.6
25	Reclining Pulse Pressure (S)	Millimeters of Mercury	44.8	± 9.3
26	Pulse after Exercise (S)	Beats per Minute	103.8	±12.7
27	Time for Pulse to Return to Normal (S)	Seconds	31.1	±23.8
28	Points for Pulse Increase (Reclining to Standing) (S)	-	0.8	± 1.5
29	Points for Blood Pressure Increase (S)	-	0.6	± 1.5
30	Points for Pulse Increase after Exercise (S)	-	1.5	± 1.1
31	Points for Pulse Return (S)	-	2.6	± 0.8
32	Schneider Score	-	9.5	± 4.1
33	Dynamometer Score, Right Hand	Kilograms	46.8	± 6.4
34	Dynamometer Score, Left Hand	Kilograms	46.4	± 6.6
35	Body Surface Area	Square Meters	1.8	± 0.1

* These additional values are given in order to present all pulse counts in comparable terms (beats per minute). They are relative rather than actual values. Thus, in variable 02, for example, the mean in parentheses (131.6) does not imply that pulse counts were continued for one minute after the exercise; it is simply the rate 5-20" after exercise expressed in terms of beats per minute.

Table C-6

Rotated Factor Loadings for Physical Fitness Study
Population = 109

Variable No.	Description of Variable	Pulse Factors						En
		1	2	3	4	5	6	7
01	Resting Pulse (N)	.50	-.02	.03	.56	-.10	.15	.01
02	Pulse 5-20 Seconds after Exercise (N)	.51	.12	.30	.42	.10	-.08	.08
03	Pulse 105-135 Seconds after Exercise (N)	.60	.12	.02	.59	.03	.04	-.09
04	Endurance Time (N)	.09	.05	-.03	-.04	.06	.00	.30
05	Pulse 5-20 Seconds after Endurance (N)	.25	-.09	.40	.26	.00	.08	.00
06	Cardiovascular Score (N)	.64	.19	.12	.69	.01	-.05	-.04
07	Resting Pulse (H)	.60	-.13	.07	.10	.24	.11	-.04
08	Endurance Time (H)	-.04	.04	.04	.08	-.05	-.01	.78
09	Pulse 5-20 Seconds after Endurance (H)	.01	-.10	.81	.03	-.04	.19	-.45
10	Pulse Increase after Endurance (H)	-.14	.06	.84	-.01	-.06	.10	-.42
11	Pulse 1.0-1.5 Minutes after Endurance (H)	.16	.03	.70	-.03	.22	-.09	-.51
12	Pulse 2.0-2.5 Minutes after Endurance (H)	.46	.13	.52	-.19	.53	-.19	-.29
13	Pulse 3.0-3.5 Minutes after Endurance (H)	.50	.05	.42	-.08	.41	-.03	-.19
14	Harvard Score (H)	-.26	-.09	-.40	.00	-.23	.09	.76
15	Age	.01	-.04	-.02	-.13	.08	-.02	-.22
16	Standing Pulse (S)	.49	.61	.03	.02	-.02	.60	.06
17	Points for Standing Pulse (S)	-.43	-.57	-.03	.02	.05	-.62	-.06
18	Reclining Pulse (S)	.51	.07	-.03	.02	.00	.61	-.02
19	Points for Reclining Pulse (S)	-.40	.07	.00	.19	.05	-.84	-.01
20	Standing Systolic Blood Pressure (S)	.14	-.01	.16	.06	.13	-.01	-.05
21	Standing Diastolic Blood Pressure (S)	.17	-.02	.10	.09	.13	-.08	-.08
22	Reclining Systolic Blood Pressure (S)	.11	.12	.11	-.04	.09	.21	-.04
23	Reclining Diastolic Blood Pressure (S)	.12	.03	-.04	.04	.08	.00	.01
24	Standing Pulse Pressure (S)	.10	-.01	.10	-.03	.08	.07	-.11
25	Reclining Pulse Pressure (S)	.07	.02	.16	-.05	.04	.11	-.12
26	Pulse after Exercise (S)	.48	.55	.04	-.05	.07	.51	.01
27	Time for Pulse to Return to Normal (S)	.12	-.02	.09	.04	-.06	.10	-.24
28	Points for Pulse Increase (Reclining to Standing) (S)	-.36	-.66	-.15	.01	.00	-.41	-.07
29	Points for Blood Pressure Increase (S)	-.03	-.30	.06	.08	.03	-.17	-.02
30	Points for Pulse Increase after Exercise (S)	-.36	-.44	-.03	.02	-.03	-.40	-.03
31	Points for Pulse Return (S)	- 17	-.07	-.02	.00	-.07	- 07	.24
32	Schneider Score	-.38	-.55	-.06	.08	.00	-.58	-.01
33	Dynamometer Score, Right Hand	.11	.05	.02	.11	.01	.01	-.21
34	Dynamometer Score, Left Hand	.10	-.12	.09	.01	.07	.01	-.23
35	Body Surface Area	.11	.12	.18	.04	.05	.02	-.20

* h^2 = Communality.

Table C-6

tated Factor Loadings for Physical Fitness Study
Population = 109

	Pulse Factors						Endurance Factors				Blood Pressure Factors					h^2*
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	.50	-.02	.03	.56	-.10	.15	.01	.12	.04	.01	-.13	.01	.05	.05	.03	.64
	.51	.12	.30	.42	.10	-.08	.08	.03	-.01	.10	.04	.00	-.01	-.08	.04	.58
	.60	.12	.02	.59	.03	.04	-.09	.13	.04	-.03	.06	.00	-.01	.04	-.09	.77
	.09	.05	-.03	-.04	.06	.00	.30	-.05	.04	.11	.11	.09	.11	-.09	.02	.16
	.25	-.09	.40	.26	.00	.08	.00	.12	.15	.09	-.04	.04	.04	.02	-.06	.36
	.64	.19	.12	.69	.01	-.05	-.04	.06	.04	.00	.04	-.05	-.04	.05	-.11	.97
	.60	-.13	.07	.10	.24	.11	-.04	.09	-.02	.04	.17	.05	.00	-.04	-.13	.52
	-.04	.04	.04	.08	-.05	-.01	.78	.00	-.03	.31	-.06	-.10	-.08	.00	-.01	.74
	.01	-.10	.81	.03	-.04	.19	-.45	-.03	-.01	-.02	-.08	.10	.09	.03	-.11	.95
	-.14	.06	.84	-.01	-.06	.10	-.42	-.08	.03	.03	-.09	.06	.09	.03	.08	.95
	.16	.03	.70	-.03	.22	-.09	-.51	.09	-.09	.00	.09	.06	.02	-.02	-.06	.87
	.46	.13	.52	-.19	.53	-.19	-.29	.00	-.08	.01	.05	.03	.00	.02	-.11	.96
	.50	.05	.42	-.08	.41	-.03	-.19	.03	-.12	.03	.00	-.03	-.04	.02	-.04	.66
	-.26	-.09	-.40	.00	-.23	.09	.76	.01	.06	.20	-.13	-.03	.01	.01	.06	.94
	.01	-.04	-.02	-.13	.08	-.02	-.22	-.20	-.03	-.08	.05	.01	.00	-.04	-.01	.13
	.49	.61	.03	.02	-.02	.60	-.06	.03	-.09	.03	-.04	-.05	-.04	-.03	.00	.99
	-.43	-.57	-.03	.02	.05	-.62	-.06	-.02	.05	-.03	.09	.01	.00	.09	-.05	.92
	.51	.07	-.03	.02	.00	.61	-.02	-.10	-.04	-.06	.04	.18	.03	.04	.02	.69
	-.40	.07	.00	.19	.05	-.84	-.01	.07	.07	.00	-.02	-.07	.00	.19	-.14	.98
	.14	-.01	.16	.06	.13	-.01	-.05	.10	.04	.01	.69	.46	.41	.04	.19	.97
	.17	-.02	.10	.09	.13	-.08	-.08	.07	.06	-.01	.54	.22	-.38	.15	.30	.68
	.11	.12	.11	-.04	.09	.21	-.04	.16	.08	-.02	.70	.05	.21	.52	-.19	.97
	.12	.03	-.04	.04	.08	.00	.01	-.01	-.06	.00	.60	.04	-.08	-.44	-.23	.64
	.10	-.01	.10	-.03	.08	.07	-.11	.06	.01	-.02	.15	.61	.69	.10	.02	.93
	.07	.02	.16	-.05	.04	.11	-.12	.15	.14	-.01	.11	.25	.19	.87	-.15	.99
	.48	.55	.04	-.05	.07	.51	.01	-.06	.14	.02	.08	.01	.00	.02	.03	.83
	.12	-.02	.09	.04	-.06	.10	-.24	.03	.89	-.07	.08	.00	-.04	.05	.18	.94
ing) (S)	-.36	-.66	-.15	.01	.00	-.41	-.07	-.06	.09	-.06	.15	.19	.11	.05	-.12	.86
	-.03	-.30	.06	.08	.03	-.17	-.02	.05	-.04	.00	.10	.24	.17	-.08	.80	.88
	-.36	-.44	-.03	.02	-.03	-.40	-.03	-.04	-.14	-.01	-.09	-.07	-.04	-.03	-.06	.53
	-.17	-.07	-.02	.00	-.07	-.07	.24	.04	-.90	.08	.00	-.13	-.10	.04	-.08	.95
	-.38	-.55	-.06	.08	.00	-.58	-.01	.01	-.27	-.01	.08	.20	.13	-.03	.21	.97
	.11	.05	.02	.11	.01	.01	-.21	.86	.12	-.08	-.10	.01	.03	.03	-.07	.85
	.10	-.12	.09	.01	.07	.01	-.23	.81	.11	-.06	-.10	.00	.05	-.01	.00	.77
	.11	.12	.18	.04	.05	.02	-.20	.58	.03	-.03	.13	.06	.02	-.08	-.04	.47

Summary of Factor Analysis*

Factors isolated by the analysis, as shown by the factor loadings in Table C-6, are as follows:

Factor 1 was found for resting pulse measures (variables 01, 07, and 18), standing and mild exercise pulse measures (variables 16 and 26), and for pulse measures after recovery from strenuous exercise (variables 02, 03, 12, and 13). It was felt that this factor represented a basic physiological condition underlying pulse measurements, and accordingly it was designated basic resting pulse.

The taking and recording of resting pulse rate is a standard part of most physical checkups, and deviation from the expected normal rate is part of the diagnosis of certain diseases. The concept is well established, then, and the isolation of such a factor is to be expected. The surprising and somewhat disturbing point, however, is the relatively small portion of individual difference in pulse readings which can be accounted for by this basic physiological factor. Even under fairly ideal conditions (variables 01, 07, and 18), only about 25-36 per cent (squares of the factor loadings) of individual variation in pulse readings can be attributed to anything having day-to-day stability, and the major part of such individual variation must be accounted for by situational, short term, or chance factors rather than attributed to actual physiological condition. Reliance in any single measure of resting pulse, then, is small indeed.

Factor 2 was present only for the standing pulse and pulse after exercise measures of the Schneider test. These represent moderate exercise pulse rates which are higher than the resting pulse rates for the three fitness tests, but lower than the other pulse measures taken. Hence, the factor is called pulse response to mild exercise. The fact that these moderate exercise pulse rates are not at all related to pulse rates taken after the exhaustive endurance runs indicates that they provide no basis for predicting the pulse response to greater loads; hence, they are regarded as useless for the particular purposes of this study.

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*For further details concerning these data, see: Cook, E. B. and R. J. Wherry. A Statistical Evaluation of Physical Fitness Tests. Research Quarterly of the American Association for Health, Physical Education, and Recreation, 21:2, May 1950.

Factor 3 was found for all pulse measures taken after strenuous exercise. It appeared first in the 110-140 pulse range and persisted when the pulse returned through these levels after exercise. When the rate rose to the 150-200 level, pulse measurements rested almost entirely on this reaction to violent exercise, and basic resting pulse rate and diurnal-situational factors were absent or present minimally. Since the conditions (violent exercise) leading to influence by this factor are related to potentially dangerous conditions of stress, factor 3 is considered of consequence in the military service selection picture. Current methods of scoring unfortunately give little weight to the factor.

Factor 3 shows up more clearly on the pulse readings of the Harvard Step Test than it does on those of the Navy endurance test. Possibly this is due to the greater speed with which high pulse rates are approached in the latter, and the earlier cessation of endurance caused by the greater pulse acceleration of the Navy test. In order to include the temporal connotation, factor 3 is labeled <u>pulse response to prolonged violent exercise</u>.

A factor specific to the pulse measurements of each of the three fitness tests was isolated. Thus, measurements taken for the three tests exhibited some influence peculiar to each, one which was not carried over from one situation to another. These factors are taken to indicate that pulse rate differences among individuals tend to remain relatively constant for any given day, but that such differences are not repeatable from day to day. The factors are designated <u>diurnal stability specifics</u> -- Navy Step Test (factor 4), Harvard Step Test (factor 5), and Schneider Index (factor 6).

Interpreted thus, the factors throw some light on the low reliability of pulse measurements from one day to another, noted in connection with factor 1, and help to explain the frequently observed fact that an applicant who fails to meet pulse rate standards on a given examination under a given examiner may qualify upon subsequent examination by either the same or a different examiner.

These diurnal pulse stability factors indicate also that service personnel who qualified a month (or even a day) previously, may not necessarily qualify for flight or other exacting duty on any given day. Since they suggest that a particularly high or low pulse reading will tend to persist for the next several hours at least, they lend support to the practice of taking pulse measurements immediately before potentially physically exhaustive assignments.

An average pulse reading with a reliability of 0.90 may be obtained for an individual's basic pulse rate on any given day by taking

three measures of resting pulse. This statement is based upon the correlation of 0.72 between variables 01 and 03 in the Navy Step Test.*

Reliability for readings on the same day should not be taken to warrant predictions concerning the next or any other day for there the reliability drops to the neighborhood of 0.35 and emphasizes the essentially diurnal nature of the stability.

Factor 7 appeared on variables representing the endurance time in seconds for the two tests which measured endurance; accordingly, it was labeled endurance under violent exercise. It showed more clearly for the Harvard than for the Navy test. These two tests differ primarily with respect to the rate at which the exhaustion level is reached. The longer (mean of 291.0 versus 199.2 seconds) and more uniform time (standard deviation of 29.9 versus 77.4) of the Harvard test may have led to a more rigid test of endurance, or it could well be that long heavy loads and short heavier loads measure different kinds of endurance. The presence of more Harvard measures in the battery may weight the factor in the direction of the long heavy load effects rather than short heavier load effects. In any event, endurance time in seconds appears to be a basic repeatable measure of individual differences. The question of which endurance measure is more important for the services would depend on the particular service task for which one wished to predict performance.

This endurance factor exhibited a negative relationship to pulse measures after violent exercise, indicating that failure to continue an endurance run is based in part upon cardiovascular increase; that is to say, individuals with the most pulse change tend to stop sooner. Similarly, the negative relationship between the factor and the time for pulse to return to normal indicates that persons whose increased pulse rates take longer to return to normal after exercise also tend to stop sooner. The present data do not permit a statement as to whether individuals are aware of these physiological conditions and respond to them directly, or whether previous experience has conditioned them to unconscious avoidance of over-exertion. In either case, assuming that motivation is adequate, cessation of an endurance run appears to be a protective device adopted sooner by persons whose physiological condition makes protection most important.

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*Spearman-Brown Prophecy formula (Guilford, J. P. Psychometric Methods. New York: McGraw-Hill Book Co., 1936).

The endurance factor exhibited a negative relationship also with the strength of grip and body surface area measures. This finding is in line with the usual negative relationship between size and weight with calisthenics such as chins and dips. Correction for weight is desirable, then, if any extrapolation is to be made to activities not involving actual lifting of the body.

The remaining negative relationship exhibited by this factor was for age, indicating that older men find such activity harder to maintain. When it is recalled that the men in this study did not exceed 26 years of age, the wisdom of establishing upper age ceilings for any armed service task requiring long maintenance of violent bodily activity is evident. Similarly, maximum weight and size ceilings should be set for tasks requiring long, continuous climbing or other sustained exertion which involves the lifting of one's own weight.

Factor 8 is poorly defined; hence the name assigned to it remains tentative. It is present for the hand dynamometer scores and the body surface area measurement and exhibits a negative relationship for age. The dynamometer loadings could indicate strength, arm muscle development, or mobilization of energy. The loading on body surface area might indicate mere size (reflected in increased strength) or greater muscular development (only indirectly influencing size). The negative loading for age suggests that strength rather than size is uppermost. The factor is designated size-strength (?), and is considered worthy of additional study.

Other studies relating strength-size variables to endurance indicate that it is the "lifting" of the body weight required in the step-up type of test which occasions the negative relationship of these variables to endurance.*

Factors 9 and 10 are specific factors (triplet and couplet, respectively) based upon plural representation of certain scores in the matrix of correlations; hence they have no theoretical or practical importance.

Factor 11 was present on the four basic blood pressure measures, systolic and diastolic, for standing and sitting conditions (variables 20, 21, 22, and 23), and accordingly it was designated <u>basic height of blood pressure</u>. The factor is considered a basic physiological characteristic upon which meaningful classification of individuals may be

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*Brogden, H. E. and R. H. Gaylord. Factorial Studies of Physical Proficiency Tests. Washington, D. C.: Personnel Research Section, Adjutant General's Office, Department of the Army (unpublished).

based. However, the utilization of basic resting blood pressure measures for screening under present measurement techniques entails the same dangers as does the use of basic resting pulse discussed previously.

Factor 12 was present for all derived blood pressure measurements whether obtained (a) by taking differences between systolic and diastolic under the same conditions (called pulse pressure), or (b) by taking differences between standing and sitting levels for the same type of measurement (called blood pressure increase). The factor was designated <u>variability in blood pressure level</u>.

Blood pressure recorded when standing, then, has two components: (1) the basic level component, reflected in loadings on factor 11, and (2) the variation in level due to standing, reflected in loadings on factor 12.

Factor 12 is considered to represent a basic physiological differential because it is present (a) on all methods of computing change, and (b) on both measures containing a variation component. The best measure is pulse pressure standing which involves both types of change.

Factors 13, 14, and 15 merely confirmed that the variables involved were computed according to the usual formulas. Factor 13 has significant positive loadings on variables 20 and 24 and a negative loading for variable 21. Thus, the factor indicates that pulse pressure standing equals systolic blood pressure standing minus diastolic blood pressure standing, or variable 24 equals variable 20 minus variable 21.

Similarly, the loadings for factor 14 indicated merely that pulse pressure reclining equals systolic blood pressure reclining minus diastolic blood pressure reclining, or variable 25 equals variable 22 minus variable 23.

Again, the loadings for factor 15 indicated that blood pressure increase from reclining to standing equals diastolic blood pressure standing minus diastolic blood pressure reclining, or systolic blood pressure standing minus systolic blood pressure reclining, or the combined form, blood pressure increase equals the systolic and diastolic standing measures minus the systolic and diastolic reclining measures.

Thus, factors 13, 14, and 15 are regarded as spurious in the sense of arising from plural reporting.

APPENDIX D

Psychological Tests and Personal Interview Studies

Table D-1

Summary of Psychological Test Data

Group No.	Subject No.	Minnesota Multiphasic Personality Inventory: ? Value	Lie	F	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Navy Basic Battery: G.C.T.	Arith. Reas.	Mech. Apt.	Mech. Know.	Elect. Know.	Navy Enlisted Personal Inventory: Pers. Hist.	Med. Hist.	Officer Classification Test: Mech. Comprehension	Verbal	Spatial	Two Hand Coord.	Tank Grade
01	1*	50	56	55	42	60	38	65	53	44	50	45	66	60	58	68	68	68	1	0	58	-	-	10	2
01	2*	50	50	50	44	36	51	53	51	35	41	43	59	58	55	52	50	56	3	0	56	-	-	14	1
01	3*	50	53	53	56	46	51	65	55	62	50	49	54	58	45	56	58	49	9	9	58	-	-	0	-
01	4*	50	60	55	60	56	65	60	59	44	49	55	63	56	53	62	42	47	0	0	49	-	-	13	2
01	5*	50	56	55	58	51	49	60	43	59	50	53	77	56	49	58	61	66	1	0	64	-	-	14	2
01	6*	50	60	50	42	46	64	63	43	41	42	43	52	57	65	68	56	55	0	0	60	-	-	12	2
02	1	50	70	55	51	48	58	50	51	53	43	47	59	59	49	52	58	55	0	0	41	36	49	11	2
02	2	50	60	55	40	48	56	45	61	59	41	45	66	68	74	64	68	71	1	0	57	39	63	12	1
02	3	50	50	50	42	44	47	50	55	33	43	45	54	52	60	53	45	51	1	0	42	37	58	13	2
02	4	50	50	50	42	32	49	47	55	50	45	47	59	64	69	58	60	49	0	0	48	35	44	12	2
02	5*	50	50	55	42	58	42	50	63	44	48	45	54	59	44	60	51	36	1	1	44	35	48	0	2
02	6	50	60	50	42	51	53	55	47	41	38	41	63	60	45	56	44	47	1	0	50	31	41	12	2
03	1	50	53	60	53	51	60	60	47	44	50	51	43	55	53	45	54	50	2	0	39	44	63	11	2
03	2	50	50	50	49	48	60	65	57	53	43	48	57	63	74	57	45	54	1	0	57	56	68	13	2
03	3	50	50	50	40	32	51	50	51	53	41	44	54	62	45	63	61	50	1	0	37	26	58	13	2
03	4	50	50	53	42	39	49	65	49	35	41	51	65	71	71	69	66	56	3	0	57	46	63	11	2
03	5	50	50	60	51	51	44	42	53	44	68	51	54	67	78	68	54	52	0	0	51	38	75	13	2
03	6	50	50	62	42	39	49	47	63	47	46	51	77	70	62	59	71	70	3	0	59	46	65	13	2
04	1	50	50	50	49	44	49	47	45	35	45	43	54	69	49	64	43	50	1	0	37	40	58	13	2
04	2	50	50	50	51	53	49	60	63	41	56	48	57	67	67	48	51	54	3	0	13	36	53	13	2
04	3	50	66	60	56	51	49	75	53	53	48	53	61	58	54	61	56	53	2	1	37	35	24	11	2
04	4*	50	50	50	47	56	53	47	49	41	38	43	52	70	70	69	62	61	2	0	44	35	56	16	2
04	5	50	53	58	58	46	56	53	45	56	48	53	59	58	62	63	58	54	1	0	53	36	61	12	2
04	6	50	50	50	42	39	55	42	49	47	39	40	63	51	51	45	36	43	0	1	26	33	41	09	2
05	1	50	60	53	40	48	55	47	47	38	38	41	63	62	52	57	51	50	0	0	28	30	49	13	2
05	2*	50	50	58	44	51	49	40	61	38	45	43	59	47	45	48	55	52	0	0	24	38	33	12	2
05	3*	50	53	50	44	46	44	60	51	50	45	43	66	62	65	58	41	59	3	0	30	33	45	10	[illegible]
05	4	50	50	50	42	48	51	60	43	50	38	41	59	55	52	48	53	43	3	0	30	35	24	06	2
05	5	50	63	50	42	48	56	50	73	56	41	48	50	57	54	53	55	47	1	0	28	33	53	09	1
05	6	50	56	50	40	53	58	58	49	53	36	40	45	63	67	60	60	54	0	0	41	33	56	14	2
06	1	50	50	50	42	44	53	47	37	47	38	44	68	57	60	57	51	51	0	0	53	33	56	12	2
06	2	50	50	50	42	46	45	40	49	35	45	41	54	50	45	53	52	50	1	0	44	30	58	15	3
06	3	50	50	58	44	44	49	53	47	33	52	51	70	70	71	59	67	55	1	0	60	42	53	13	3
06	4	50	50	50	40	56	44	45	57	53	41	38	52	54	51	58	56	51	2	0	41	36	46	12	2
06	5	50	50	50	49	51	47	50	53	50	48	55	52	60	51	55	62	54	2	0	57	37	63	11	2
06	6	50	50	55	53	56	53	68	76	50	57	52	45	61	47	45	49	55	4	0	23	37	49	07	2
07	1*	50	66	50	51	53	62	50	41	41	45	40	45	50	65	53	43	63	0	0	44	32	36	11	-
07	2*	50	50	50	42	41	51	37	45	50	38	44	63	50	51	67	66	54	0	0	66	33	56	10	2
07	3	50	50	53	53	41	53	47	57	41	50	59	66	71	76	64	68	65	5	1	69	44	61	13	2
07	4*	50	50	50	47	46	44	50	45	33	45	45	59	59	51	62	51	61	0	1	24	33	68	11	2
07	5	50	53	50	49	46	53	40	47	35	46	44	48	56	54	60	62	67	0	0	48	36	53	13	2
07	6	50	50	55	40	39	49	47	39	47	39	40	50	60	56	60	57	57	1	0	50	35	46	11	2
08	1	50	50	50	44	46	47	65	49	50	48	53	72	62	54	59	52	49	0	0	53	37	44	13	2
08	2	50	60	50	56	48	58	55	59	50	46	52	54	65	70	59	55	51	3	0	51	32	53	12	2
08	3	50	50	53	53	44	51	63	47	56	52	48	54	62	65	58	41	59	0	0	39	33	63	12	2
08	4	50	53	50	42	48	53	47	57	59	39	45	54	55	65	63	43	54	4	0	57	30	63	11	2
08	5*	50	50	50	47	53	49	73	55	44	48	45	48	62	49	49	57	53	6	0	33	39	39	11	2
08	6*	50	60	60	72	56	84	70	61	53	42	56	52	54	56	61	64	72	0	0	57	33	30	12	2
09	1*	50	53	53	49	63	55	68	65	53	53	53	57	63	54	60	46	52	0	0	48	35	58	08	3
09	2	50	60	50	42	56	55	58	59	59	42	44	66	56	53	58	51	42	0	0	30	39	53	12	2
09	3*	50	50	50	42	53	49	42	59	38	50	44	57	56	52	45	47	50	0	1	24	35	44	11	2
09	4*	50	56	50	40	46	44	45	57	56	43	41	54	59	58	62	62	65	0	0	59	36	53	09	2
09	5	50	63	50	44	51	58	42	49	53	39	38	50	61	58	66	44	63	1	0	39	37	58	12	2
09	6*	50	50	70	47	44	49	55	63	41	43	53	63	70	54	62	75	62	1	0	59	51	53	12	2
10	1	50	53	50	40	51	40	53	49	35	38	45	52	66	71	49	56	67	0	0	53	39	44	10	2
10	2	50	56	53	42	58	55	45	49	50	39	44	52	56	54	60	60	52	0	0	50	35	44	15	1
10	3	50	50	62	51	36	42	63	53	44	64	56	70	50	44	49	62	55	0	0	39	30	56	08	2
10	4	50	50	50	40	44	51	50	43	41	38	43	66	55	60	68	64	52	0	0	50	32	73	14	2
10	5	50	70	50	42	46	60	42	51	47	38	38	61	54	65	60	45	42	0	0	50	37	53	11	2
10	6	50	50	50	44	56	53	47	43	41	39	43	61	65	49	61	56	68	0	0	48	36	58	13	2
11	1	50	50	50	51	53	55	45	55	47	42	43	52	66	49	51	44	44	0	0	48	38	34	10	2
11	2	50	50	50	42	34	49	47	51	38	39	43	57	60	58	62	61	50	0	0	44	37	15	09	2
11	3	50	53	50	40	41	49	55	43	50	42	43	66	63	53	63	56	61	0	0	59	39	51	10	1
11	4*	50	50	53	42	44	56	63	57	44	43	49	75	55	54	50	51	47	1	0	39	36	24	11	-
11	5	50	50	50	42	41	47	47	55	47	45	44	63	51	54	65	61	68	1	0	62	34	46	15	2
11	6	50	50	53	51	53	49	32	67	47	50	63	75	68	76	58	59	65	4	0	73	39	46	13	1
12	1	50	50	50	53	60	51	53	55	62	46	43	50	51	52	44	43	37	3	0	23	35	39	11	1
12	2*	50	50	80	78	70	69	53	39	50	66	74	70	52	36	67	53	58	0	1	62	30	41	13	2

08	2	50	60	50	56	48	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
08	3	50	50	53	53	44	51	63	47	56	52	48	54	62	65	58	41	59	0	0	39	55	63	12	2
08	4	50	53	50	42	48	53	47	57	59	39	45	54	55	65	63	43	54	4	0	57	30	63	11	2
08	5*	50	50	50	47	53	49	73	55	44	48	45	48	62	49	49	57	53	6	0	33	39	39	11	2
08	6*	50	60	60	72	56	84	70	61	53	42	56	52	54	56	61	64	72	0	0	57	33	30	12	2
09	1*	50	53	53	49	63	55	68	65	53	53	53	57	63	54	60	46	52	0	0	48	35	58	08	3
09	2	50	60	50	42	56	55	58	59	59	42	44	66	56	53	58	51	42	0	0	30	39	53	12	2
09	3*	50	50	50	42	53	49	42	59	38	50	44	57	56	52	45	47	50	0	1	24	35	44	11	2
09	4*	50	56	50	40	46	44	45	57	56	43	41	54	59	58	62	62	65	0	0	59	36	53	09	2
09	5	50	63	50	44	51	58	42	49	53	39	38	50	61	58	66	44	63	1	0	39	37	58	12	2
09	6*	50	50	70	47	44	49	55	63	41	43	53	63	70	54	62	75	62	1	0	59	51	53	12	2
10	1	50	53	50	40	51	40	53	49	35	38	45	52	66	71	49	56	67	0	0	53	39	44	10	2
10	2	50	56	53	42	58	55	45	49	50	39	44	52	56	54	60	60	52	0	0	50	35	44	15	1
10	3	50	50	62	51	36	42	63	53	44	64	56	70	50	44	49	62	55	0	0	39	30	56	08	2
10	4	50	50	50	40	44	51	50	43	41	38	43	66	55	60	68	64	52	0	0	50	32	73	14	2
10	5	50	70	50	42	46	60	42	51	47	38	38	61	54	65	60	45	42	0	0	50	37	53	11	2
10	6	50	50	50	44	56	53	47	43	41	39	43	61	65	49	61	56	68	0	0	48	36	58	13	2
11	1	50	50	50	51	53	55	45	55	47	42	43	52	66	49	51	44	44	0	0	48	38	34	10	2
11	2	50	50	50	42	34	49	47	51	38	39	43	57	60	58	62	61	50	0	0	44	37	15	09	2
11	3	50	53	50	40	41	49	55	43	50	42	43	66	63	53	63	56	61	0	0	59	39	51	10	1
11	4*	50	50	53	42	44	56	63	57	44	43	49	75	55	54	50	51	47	1	0	39	36	24	11	-
11	5	50	50	50	42	41	47	47	55	47	45	44	63	51	54	65	61	68	1	0	62	34	46	15	2
11	6	50	50	53	51	53	49	32	67	47	50	63	75	68	76	58	59	65	4	0	73	39	46	13	1
12	1	50	50	50	53	60	51	53	55	62	46	43	50	51	52	44	43	37	3	0	23	35	39	11	1
12	2*	50	50	80	78	70	69	53	39	50	66	74	70	52	36	67	53	58	0	1	57	39	61	13	2
12	3	50	50	50	53	46	51	53	43	50	56	51	48	61	62	51	35	45	1	0	35	56	38	10	1
12	4	50	50	50	40	46	53	40	51	41	42	45	68	66	72	57	51	64	0	0	37	41	63	10	1
12	5	50	66	55	65	41	64	47	73	56	61	63	77	52	54	70	66	63	6	2	55	34	63	14	2
12	6	50	50	50	47	41	51	53	30	47	41	41	52	60	60	50	57	43	1	0	42	38	36	13	2
13	1	50	50	50	47	44	55	55	47	56	48	53	72	58	56	50	43	40	3	0	37	35	44	09	2
13	2	50	50	50	49	51	56	58	49	59	41	48	50	61	45	57	50	46	0	0	39	43	53	14	2
13	3	50	56	53	44	48	58	47	61	53	38	44	66	57	40	68	54	67	0	0	59	34	61	13	2
13	4	50	73	53	51	72	62	53	53	50	42	44	48	48	54	59	53	70	2	0	48	35	44	08	2
13	5	50	50	60	42	44	53	[illegible]	34	38	43	47	70	65	49	60	60	63	0	0	50	37	39	13	2
13	6	50	53	55	47	48	45	47	43	41	43	45	54	56	45	50	61	57	1	0	28	37	51	13	2
14	1	50	50	50	49	41	53	68	47	38	46	48	70	65	56	52	59	60	4	0	44	41	53	13	2
14	2	50	60	55	51	58	44	63	57	50	53	53	50	57	56	54	52	49	1	0	26	37	63	13	2
14	3*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	4	50	50	50	53	39	53	45	55	50	56	53	59	49	55	58	43	55	2	0	41	26	63	09	1
14	5*	50	50	50	40	39	49	47	39	50	46	44	68	56	47	64	56	52	1	0	48	32	46	12	1
14	6*	50	63	50	40	46	60	47	61	53	39	44	59	58	65	45	59	43	4	0	33	35	41	12	2
15	1*	50	50	66	47	48	49	70	37	47	48	55	72	70	67	58	62	51	1	0	46	40	61	09	-
15	2	50	50	50	44	39	42	45	59	50	49	49	66	52	53	55	44	40	1	0	42	31	53	09	2
15	3	50	70	50	47	56	58	53	47	53	36	40	39	67	60	49	41	64	0	0	35	47	36	11	2
15	4	50	70	53	42	44	58	47	34	53	36	41	39	58	63	64	57	72	2	0	48	35	61	11	2
15	5	50	63	50	44	58	45	53	39	44	45	44	61	51	56	54	57	63	1	0	50	35	49	14	2
15	6	50	60	55	44	63	65	53	51	53	42	40	52	68	63	56	39	49	0	0	37	39	46	11	2
16	1	50	50	50	40	46	40	32	37	47	45	45	48	66	58	63	64	71	0	0	59	35	53	14	2
16	2	50	63	55	60	58	56	45	47	50	48	45	59	40	36	50	57	56	1	1	21	35	34	11	2
16	3*	50	53	70	76	63	80	81	71	50	54	64	66	74	54	51	43	40	5	1	21	54	51	10	-
16	4	50	50	50	40	48	56	55	51	50	38	40	54	58	65	69	63	47	0	0	59	30	65	14	2
16	5	50	66	50	47	48	64	55	47	59	39	41	48	55	56	56	42	49	2	0	50	43	44	09	3
16	6	50	50	55	42	51	55	60	41	50	39	44	54	64	62	57	62	67	1	0	66	41	68	15	2
17	1	50	50	64	51	46	51	60	53	47	45	56	75	48	58	66	56	51	4	0	44	31	44	12	2
17	2	50	50	53	47	53	51	63	53	59	52	56	54	55	69	53	45	45	2	0	30	36	41	11	2
17	3	50	50	60	42	48	63	50	63	47	52	49	72	66	67	67	43	50	0	0	51	33	56	11	2
17	4	50	53	50	40	39	47	50	57	50	41	44	59	62	45	63	59	59	0	0	57	35	61	12	2
17	5	50	50	53	42	51	53	50	41	47	38	44	52	58	69	57	53	52	0	0	50	34	65	13	2
17	6*	50	56	53	49	46	64	53	45	53	41	44	50	52	60	57	53	45	2	0	53	34	58	12	2
18	1*	50	50	62	58	48	51	68	69	53	61	70	63	70	78	69	56	63	3	0	66	39	63	11	2
18	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	3	50	50	53	40	36	47	37	47	53	43	43	59	54	66	53	58	45	0	0	41	35	44	11	1
18	4	50	56	53	42	44	51	50	49	50	45	49	57	54	47	63	67	65	0	0	48	33	63	13	1
18	5	50	50	55	51	51	56	63	37	38	46	49	68	60	53	66	60	62	1	0	64	34	56	12	2
18	6	50	53	50	42	56	56	60	41	47	41	43	52	52	53	62	58	59	1	0	67	36	68	12	1
19	1	50	50	50	49	63	49	63	53	35	48	48	59	58	60	52	55	47	0	0	46	32	53	12	2
19	2	50	50	50	40	29	45	45	47	41	38	41	48	52	60	54	50	51	0	0	50	33	46	12	1
19	3*	50	53	60	62	58	65	58	69	59	46	55	68	57	53	52	44	47	0	0	55	36	51	12	2
19	4*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	5	50	56	55	42	60	51	42	65	62	53	49	48	54	49	55	64	47	5	0	39	39	68	16	2
19	6	50	66	50	42	60	62	53	71	59	41	40	57	52	65	54	52	55	0	0	26	33	41	13	2
20	1	50	50	50	44	53	44	50	37	41	41	44	72	71	71	68	58	64	1	0	66	40	70	09	1
20	2	50	60	50	47	46	62	50	43	56	39	43	54	56	53	47	41	59	1	0	39	35	49	11	2
20	3*	50	50	53	47	48	55	58	55	44	43	45	57	48	41	41	47	44	0	0	38	35	49	09	2
20	4	50	60	50	42	39	49	50	45	44	39	38	57	56	47	53	59	51	1	0	47	35	56	11	2
20	5	50	53	53	49	44	60	55	53	53	41	43	57	56	47	60	69	51	0	0	60	33	56	15	3
20	6	50	60	50	44	48	45	55	51	53	46	43	70	48	49	57	61	61	3	0	41	33	56	09	1

* Subject not included in analysis.
\- Indicates no data.

Figure D-1

Sample of Navy Enlisted Personal Inventory Form

PERSONAL QUESTIONNAIRE

PRINT CLEARLY:

____

(Last name) (First name) (Middle name) Rate Date

(Date of birth) | (Last school grade completed) | (Date of Enlistment in Navy)

I AFFIRM THAT THE ANSWERS TO THE ENCLOSED QUESTIONS ARE TRUE.

____

(Your signature)

NOTE: Persons with previous submarine experience must complete the Supplementary Submarine Questionnaire.

- -

USS ______________________ ______________________

(Date)

1. Subject applicant has been examined in accordance with Par. 1535 of the Manual of the Medical Department, as revised in R1-OIM, P2-5/SS(123), of 21 Apr 1944, and has been found physically and temperamentally qualified for Submarine duty.

____________________MC, USN

- -

Figure D-1 (cont)

PERSONAL DESCRIPTION

DIRECTIONS: For each question, make a heavy black mark between the dotted lines alongside the statements in either the left or the right column showing the answer which fits you best. Even if neither answer fits you very well, mark the one that fits you better than the other. Answer every question.

1. I was a sickly child..........	1. I was an active child........
2. I have felt bad more from head cold..................	2. I have felt bad more from dizziness.................
3. I seek excitement	3. I avoid excitement..........
4. I like to have people do things my way	4. I like to have people figure things out for me...........
5. I am more nervous	5. I am more easy going........
6. Somehow I never could find enough to do in my free time ...	6. My free time always seemed to be filled ....
7. I wish I wouldn't feel so tired	7. I wish I could have a more responsible job ....
8. I wish I could have more excitement	8. I wish I weren't bothered by bad dreams................
9. I wish I didn't have so many aches and pains	9. I wish I wouldn't keep changing my mind...............
10. I wish I weren't so nervous....................	10. I wish I wouldn't keep putting things off.................
11. I wish I could get myself to take more chances	11. I wish worrying wouldn't make me sick to my stomach.......
12. I have more headaches than the average person ....Yes.	12. ....No..
13. The hours at night seem long ....Yes.	13. ....No..

14. I like most any kind of food....	14. I have a poor appetite........
15. After exertion I feel hungry....	15. After exertion I feel dizzy....
16. When excited I feel weak......	16. When excited I feel stronger..
17. I think I might like to watch a surgical operation sometime...	17. The sight of blood upsets me ....
18. My heart sometimes speeds up for no reason at all.........Yes	18. ....No
19. I often have difficulty in falling asleep or in staying asleep ....Yes	19. ....No
20. I have never gone to a doctor for headaches or dizzy spells......................	20. I have occasionally gone to a doctor for headaches or dizzy spells.....................

Figure D-1 (cont)

PERSONAL HISTORY

DIRECTIONS: To the right of every question below are two answer spaces, one marked "Y" and the other marked "N". Fill in the space under the letter "Y" if you answer YES to the question asked. Fill in the space under the letter "N" if you have to answer NO to the question asked. Answer every question.

	Y	N
1. I graduated from high school	_	_
2. I have studied a modern foreign language	_	_
3. I have passed my 19th birthday.	_	_
4. I have passed my 30th birthday.	_	_
5. I was brought up by my own parents	_	_
6. My own mother is living. .	_	_
7. My own father is living. . .	_	_
8. My own parents are separated or divorced (answer only if both are living). . .	_	_
9. My family was once on relief.	_	_
10. I am married.	_	_
11. I have been married, but am divorced or expect to become divorced.	_	_
12. I have repeated a grade in grammar or high school. .	_	_
13. I have been expelled or suspended from school.	_	_
14. I was once sent to a reform school	_	_
15. I have (or have had) a license to drive an automobile in my home state.	_	_
16. I have been arrested for a traffic violation more than twice.	_	_
17. I have been picked up by civilian police for other offenses	_	_
18. I have been convicted for such other offenses	_	_
19. I have been picked up by the Shore Patrol or by the Military Police within the last two years	_	_
20. I have had a reduction in rating	_	_
21. I have had a Deck Court Martial	_	_
22. I have had a Summary Court Martial	_	_
23. I have had a General Court Martial	_	_
24. I have been put on report twice or more often within the past year	_	_
25. Have you ever been examined and disqualified for Submarine duty before this time.	_	_

26. If you answer "Yes" to Question 25, where were you examined? (Print clearly). . . . .

Figure D-1 (cont)

MEDICAL HISTORY

DIRECTIONS: To the right of every question below, etc.....

		YES	NO
1.	Do you suffer badly from frequent severe headaches?	___	___
2.	Did you ever have a nervous breakdown?	___	___
3.	Have you ever had a fit or convulsion?	___	___
4.	Has any doctor ever told you that you had ulcers of the stomach?	___	___
5.	Do you suffer badly from frequent loose bowel movements?	___	___
6.	Have you ever vomited blood?	___	___
7.	Have you lost a lot of weight recently?	___	___
8.	Do you stammer?	___	___
9.	Are you a sleep-walker?	___	___
10.	Are you a bed-wetter?	___	___
11.	Have you ever gotten into serious trouble or lost your job because of drinking?	___	___
12.	Have you ever had syphilis?	___	___
13.	Have you ever had gonorrhea (clap)?	___	___
14.	Have you ever suffered from asthma?	___	___
15.	Were you ever a patient at a mental hospital?	___	___
16.	Is anything wrong with your vision or your hearing?	___	___
17.	Do you know of any defects that might disqualify you medically?	___	___

Table D-2

Summary of Variables for Personality and Aptitude Test Data
With Their Means and Standard Deviations
Population = 111

Variable No.		Description of Variable	Type of Stress	Unit of Measurement	Mean	Standard Deviation
01	Minnesota Multiphasic Personality Inventory	Lie Value	P*	Standard T Score	54.10	±5.91
02		F (Validity) Value	P	Standard T Score	52.88	±4.68
03		Hs (Hypochondriasis) Value	P	Standard T Score	46.58	±6.83
04		D (Depression) Value	P	Standard T Score	48.26	±7.67
05		Hy (Hysteria) Value	P	Standard T Score	52.73	±6.89
06		Pd (Psychopathic Deviate) Value	P	Standard T Score	52.40	±8.53
07		Mf (Interest) Value	P	Standard T Score	51.27	±8.91
08		Pa (Paranoia) Value	P	Standard T Score	47.84	±7.22
09		Pt (Psychasthenia) Value	P	Standard T Score	44.78	±6.46
10		Sc (Schizophrenia) Value	P	Standard T Score	46.77	±6.29
11		Ma (Hypomania) Value	P	Standard T Score	58.55	±8.42
12		Two Hand Coordination Test	-	C Score	11.75	±1.88
13	Navy Basic Battery	General Classification Test Value	-	Test Score	58.88	±6.30
14		Arithmetical Reasoning Value	P	Test Score	56.92	±9.16
15		Mechanical Aptitude Value	P	Test Score	57.77	±6.77
16		Mechanical Knowledge Value	P	Test Score	54.55	±8.30
17		Electrical Knowledge Value	P	Test Score	54.92	±8.23
18		Tank Grade	T**	Performance Grade	2.89	±0.43
19	Navy Enlisted Personal Inventory	Personal History	P	Test Score	1.18	±1.46
20		Medical History	P	Test Score	0.08	±0.30

* P = Psychological Stress.

** T = Tank Stress.

Table D-3

Intercorrelations and Residuals of Personality and Aptitude Test Variables
Population = 111; Significance Levels: P = 0.05, $|r| \geq 0.19$; P = 0.01, $|r| \geq 0.25$

Residuals

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
01		-.01	-.01	.05	.01	-.01	-.03	.01	-.02	.02	.04	-.03	.05	.04	-.02	-.01	.07	.06	.00	.10
02	-.06		.01	.02	.04	.02	.04	-.04	.06	.01	-.01	-.03	.00	-.06	-.04	.08	-.04	.08	-.07	-.05
03	.10	.54		.00	.10	.02	-.04	-.06	.04	.05	-.07	.06	.04	.02	.00	-.03	.03	.00	.04	.09
04	.30	.20	.35		-.04	-.02	.05	.00	.01	-.05	-.03	.08	-.02	-.03	.00	-.03	.02	.01	-.05	-.05
05	.43	.23	.45	.29		-.03	.09	.05	-.08	.03	.02	.11	.01	.01	-.05	-.03	-.10	.05	.02	.05
06	.02	.21	.34	.24	.17		-.06	-.05	-.03	.00	.09	-.09	.02	-.09	.03	.10	-.05	.12	.09	-.14
07	.10	.13	.19	.17	.14	.08		-.01	-.07	-.02	-.03	.05	-.01	-.04	.00	.03	.05	.06	.00	-.05
08	.35	.02	.18	.20	.34	.08	.27		.16	-.04	-.09	.04	-.07	-.06	.00	.00	-.02	-.09	.01	-.14
09	-.21	.49	.58	.16	-.12	.21	.32	.28		-.03	-.10	-.01	-.01	.02	.09	-.11	.02	.00	-.08	-.02
10	-.18	.64	.72	.14	.14	.30	.34	.11	.75		-.10	.02	-.05	-.01	-.01	.00	.02	-.03	.03	-.05
11	-.21	.29	.11	-.19	-.12	.03	.09	-.12	.25	.39		-.06	-.03	-.07	-.02	-.05	.04	-.01	-.03	.01
12	-.08	.07	.01	.03	.07	-.15	-.10	-.10	-.07	.02	.01		.01	.05	.09	.09	-.10	.12	.03	.03
13	-.24	.06	-.12	-.09	-.12	.12	.01	-.21	.02	.13	.09	.13		.00	.00	-.02	.04	.11	.01	-.08
14	-.06	-.10	-.15	-.08	-.03	-.01	.10	-.03	.01	.10	.01	.07	.54		.01	-.04	.03	-.03	.06	-.07
15	.00	.19	.01	-.09	.05	-.06	-.09	-.02	.01	.17	.28	.29	.28	.24		.07	.10	.08	-.01	.01
16	-.06	.24	-.09	-.17	-.19	-.05	-.02	-.15	-.03	.13	.21	.33	.15	.03	.39		.08	.09	.04	-.05
17	.14	.17	.06	.06	-.05	-.05	-.08	-.14	-.01	.11	.11	.16	.27	.13	.43	.47		-.08	.05	.05
18	.07	.14	.12	.12	.14	.21	.04	-.08	.04	.02	-.08	.11	.06	-.10	.00	.01	-.09		-.02	.06
19	.01	.01	.18	-.01	-.04	.17	.30	.13	.25	.31	.09	-.03	.06	.15	-.08	.11	.03	-.04		.07
20	.12	.20	.39	.02	.12	-.08	.11	-.03	.30	.31	.22	.02	-.18	-.16	.06	.03	.06	.07	.19	

Table D-4

Rotated Factor Loadings for Personality and Aptitude Test Data
Population = 111

Variable No.*		Description of Variable	Final Factors 1	2	3	4	5	6	h^2
01	Minnesota Multiphasic Personality Inventory	Lie Value	-.06	-.26	-.34	.67	.17	-.09	.6
02		F (Validity) Value	.64	-.03	.02	-.11	.31	-.08	.5
03		Hs (Hypochondriasis) Value	.79	-.19	-.23	.03	.08	.00	.7
04		D (Depression) Value	.28	-.05	-.48	.12	.08	.01	.3
05		Hy (Hysteria) Value	.28	-.08	-.43	.34	.09	-.35	.52
06		Pd (Psychopathic Deviate) Value	.33	.16	-.38	-.04	-.01	.07	.29
07		Mf (Interest) Value	.33	.16	.01	.38	-.15	.39	.45
08		Pa (Paranoia) Value	.25	-.01	-.17	.48	-.14	.00	.34
09		Pt (Psychasthenia) Value	.72	.03	.10	-.09	-.01	.47	.76
10		Sc (Schizophrenia) Value	.93	.19	.14	-.08	.13	.18	.98
11		Ma (Hypomania) Value	.41	.09	.56	-.04	.09	-.01	.50
12		Two Hand Coordination Test	-.06	.00	.10	-.13	.36	-.08	.17
13	Navy Basic Battery	General Classification Test Value	-.02	.76	.06	-.17	.25	.01	.67
14		Arithmetical Reasoning Value	-.04	.71	.05	.13	.08	.01	.53
15		Mechanical Aptitude Value	.12	.24	.34	.14	.43	-.41	.56
16		Mechanical Knowledge Value	-.02	.00	.38	-.01	.57	.12	.48
17		Electrical Knowledge Value	-.01	.07	.01	-.04	.68	-.05	.47
18		Tank Grade	.09	-.06	-.19	-.09	-.01	-.02	.06
19	Navy Enlisted Personal Inventory	Personal History	.21	.10	.07	.16	.00	.40	.24
20		Medical History	.38	-.13	.12	.08	.05	.09	.19

* h^2 = Communality.

Summary of Factor Analysis for Psychological Test Data*

The factors isolated by the analysis, as shown by the factor loadings in Table D-4, are as follows.

Factor 1 has high positive loadings on the validity (0.64), hypochondriasis (0.79), psychasthenia (0.72) and schizophrenia (0.93) scales of the Minnesota Multiphasic Personality Inventory (MMPI), and lower but still significant loadings on the depression (0.28), hysteria (0.28), psychopathic deviate (0.33), masculinity-femininity interest (0.33), paranoia (0.25), and hypomania (0.41) scales of the MMPI, as well as on the personal (0.21) and medical (0.38) history sections of the Navy Personal Inventory. In general, then, it has significant projections on all items which measure neurotic tendencies, and is labeled <u>tendency to personality maladjustment</u>. The word "tendency" is employed to emphasize that the group was a normal one. Factor 1 appears comparable to the general factor "maladjusted tendencies" isolated by Cottle in his study of the MMPI and the Bell Adjustment Inventory (57).

Factor 2 has high positive loadings on the GCT (0.76) and arithmetic (0.71) tests and a lower positive loading (0.24) for mechanical aptitude. This factor appears indicative of the ability to follow directions, and akin to the trait measured by traditional intelligence tests. Accordingly it is designated <u>numerical-verbal intelligence</u>. The factor has a significant negative loading (-0.26) on the lie index of the MMPI, implying that persons who do well in intelligence tests tend to refrain from falsifying answers on personality tests.

Factor 3 has its highest loading on the hypomania scale of the MMPI (0.56) and significant positive loadings on mechanical aptitude (0.34) and mechanical knowledge (0.38) as well. This is a logical pattern in that overactive individuals often find outlet in mechanical pursuits. The factor is called <u>tendency to over-activity</u>.

Over-active persons possess a considerable degree of emotionality (as evidence the negative loading of -0.38 on the psychopathic deviate scale); this emotionality is shallow but varied. The factor has significant negative loadings on the "neurotic triad" -- the hypochondriasis (-0.23), depression (-0.48) and hysteria (-0.43) scales of the

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*For further details concerning these data, see: Cook, E. B. and R. J. Wherry. A Factor Analysis of MMPI and Aptitude Test Data. J. Appl. Psychol., Vol. 34, No. 4, August 1950.

MMPI -- indicating that individuals high on this factor tend to lack self-consciousness and self-criticism and have a direct acceptance of the environment. This suggestion of a "recklessness pattern" among men interested in submarine duty is somewhat similar to the finding of an Air Force study of the traits of fighter pilots.*

It is interesting to note that factor 3 has nearly zero loadings on the two-hand coordination test, although one would normally expect a correspondence between mechanical aptitude and two-hand coordination. The over-productivity in thought and action is evidently sufficient here to cause an attempt to think ahead, to "beat" the gadget by anticipating its movements and, actually, to result in poor coordination performance.

The negative loading of -0.19 on tank performance grade shown for this factor is worthy of mention, even though the loading is just under the established criterion (0.20) of significance. Tank performance rating penalizes a man who "rushes" the line in an attempt to complete the ascent too quickly. Here again, the element of impatience and impulsiveness appears. The finding is suggestive in view of a wartime service report issued after a submarine crew had been subjected to long submergence and heavy depth charging.** In the colorful language of that report: "... when the long dive was over ... the people who lasted out were those of a more phlegmatic disposition who didn't bother much when things were running smoothly. The worriers and hurriers had all crapped out, leaving the plodders to bring home the ship."

Factor 4 is labeled <u>tendency to paranoia</u> from the loading of 0.48 on the paranoia scale of the MMPI. The high loading on the lie index of the MMPI is logical in that individuals tending toward that trait approach personality tests suspiciously and are prepared to admit nothing which might show them in an unfavorable light. The loading of 0.38 on the interest scale suggests that the individuals high on factor 4 were the more effeminate members of the group. There is a negative, not quite significant, loading on GCT, suggesting that those who falsify on the lie questions of the MMPI do poorly on GCT. Thus, factors 2 and 4 give

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* U.S.A.A.F. Psychological Research on Operational Training in the Continental Air Forces: A.A.F. Aviation Psychology Program. Report No. 16, Washington, D. C.: U. S. Government Printing Office, 1947.

** U. S. Navy Depth Charging of the USS Puffer. Section 71 T of report, Enemy Anti-Submarine Measures. n.d.

corroborative support to one another. There may well be an index of stupidity present here also, with the less intelligent men falling more easily into the trap presented by the lie questions.

Factor 5 has its highest loadings on electrical knowledge (0.68), mechanical knowledge (0.57), mechanical aptitude (0.43), and two-hand coordination (0.36), and accordingly it is designated as mechanical coordination. The factor has a significant positive loading also on the validity scale of the MMPI (0.31) indicating that persons high in mechanical coordination were meticulous in answering the questions of the personality test. The negative loading on the interest scale (0.15), while not quite significant, implies that the more masculine members of the group were more proficient mechanically. Factor 5 indicates also that the expected correspondence between mechanical ability and two-hand coordination is present when loadings on neurotic items are negligible, as is the case here.

Factor 6 has positive significant loadings on the masculinity-femininity interest scale (0.39), the psychasthenia scale (0.47) and the personal history section of the Personal Inventory (0.40). The significant negative loading on mechanical aptitude (-0.41) is taken to indicate that a man leaning toward the feminine side of the interest scale is likely to get a lower score in mechanical tasks than will a person whom this scale measures as more positively masculine in interests. This supports the Terman-Miles view that there is a pronounced relationship between masculinity and mechanical pursuits at every educational level,* and Strong's definition of masculinity scores as an interest in things or objects rather than in persons or personalities.** The most likely designation for factor 6 appears to be tendency to feminity of interest pattern. The high loadings on psychasthenia shown for this factor suggests that the more effeminate man tends toward compulsive behavior; this is consistent with the MMPI test development where this is regarded as more a feminine than a masculine trait (34).

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* Terman, L. M. and C. C. Miles. Sex and Personality. New York: McGraw-Hill Company, 1936.

** Strong, E. K., Jr. Vocational Interests of Men and Women. Palo Alto: Stanford University Press, 1943.

Figure D-2

Sample of Personal Interview Rating Form

Name ______________________________ No. __________

Date of Birth ______________ Date of Active Duty __________

	Rating No.‡	Comments
Appearance and Manner		
*Assuredness or Uncertainty		
Motivation or Ambitions		
*Family History		
*Illness		
Emancipation from Home		
**Psychological and Social Maturity		
**Interest in Activities (Hobbies)		
Smoking and Use of Alcohol		
**School and Job Activities		
**Leadership		
**Participation in Athletics		
**Attitude towards Rough Sports		
*Evidence of Depression (Mood)		
*Emotionality - Stable or Excitable		
*Evidence of Apprehensiveness		
*Evidence of Chronic Tension or Acute Anxiety		
*Presence of Concomitants of Anxiety		
*Physical Fear		

SUMMARY:

* Items used to determine stress score.
** Items used to determine masculinity score.
‡ Based on a 5-point scale (see text).

Figure D-3

Criteria for the Personal Interview Questionnaire

Appearance and Manner:

Virile - impression of strength, forcefulness, rugged, well developed.
Effeminate - soft, delicate, graceful manner, weak.

Assuredness or Uncertainty:

Self confidence, self possession with natural faith in self.
Uncertain, doubtful, unconvinced of rightness of judgements, fearful of rejection.

Motivation or Ambition:

Reason for joining Submarine Service.
Why does he want it?
What is his second choice? (Is it hazardous?)

Family History:

History of nervous reactions or mental illness - unfavorable.
Family achievement, military duty of siblings.

Illnesses:

Evidence of chronic type of illnesses - both physical or psychosomatic - unfavorable.
Indifference to average illness - favorable.

Emancipation from Home:

Has the individual made an average break from the family? Judge by jobs, holidays taken away from home, decisions. It is unfavorable if he failed to make an average break from the family. Inquire as to family attitude towards submarine duty and how consent was obtained.

Psychological and Social Maturity:

Relations towards people about him.
Ability to make friends.
Interest in opposite sex - lack of interest is unfavorable.
Type of girl - frequency of intercourse.

Interest in Activities (Hobbies):

Mechanical, athletic, out of doors, executive.
Interest in reading, drama, music - less favorable but not unfavorable.

Smoking and Use of Alcohol:

Determine degree of use.
Abstinence considered less favorable.

School and Job Activities:

Determine whether change of jobs was due to ambition or lack of persistence.
Inquire into school and work records.

Leadership:

Evidence of capacity for leadership (group trends).
Captaincy of teams, etc. are favorable.
Absence of such evidence is not regarded necessarily as unfavorable. (Some men do not have such opportunity).

Participation in Athletics:

Avoidance of games employing any physical risk is unfavorable - indicates timidity.
Avoidance of boxing perhaps not so significant. Inability to swim well - should cause suspicion.

Attitude toward Rough Sports:

Aversion to such sports is unfavorable - indicates a lack of aggression or pathological antipathy to aggression. When danger is present, does he retreat or attack? Make assessments on positive judgments only.

Evidence of Depression: (Mood):

Evidence of depressed moods, lack of energy is unfavorable.
Optimism, happy and contented attitude - favorable.

Emotionality - Stable or Excitable:

Reaction to the personal interview.

Evidence of Apprehensiveness:

Evidence of teneness, anxiousness in anticipation of examinations, games, test situations.

Evidence of Chronic Tension or Acute Anxiety:

Is individual relaxed or tense?
Does he have constant feeling of tightness, muscular tension, mild sense of foreboding, concern about health, phobias?
Does he have periods of anxiety, tension, fear in a situation without known stimulus?

Presence of Concomitants of Anxiety:

Vasomotor and visceral disturbances - sweating, trembling, palpitations, insomnia, poor eating habits, nail-biting, sleepwalking, headaches, nightmares, fainting spells, bed-wetting, stammerer, tics.
History of previous nervous breakdown.

Physical Fear:

Undue concern about physical injury or death.
Excessively responsive to physical danger.
Sharp reaction to close calls.
Sense of foreboding.
Inability to swim well.
Participation in sports.
Inquire about accidents and the extent of fear reaction following them (Positive evidence - acceptable).

Table D-5

Summary of Personal Interview Data

Group No.	Subject No.	Appearance and Manner		Assuredness and Uncertainty		Motivation or Ambition		Family History		Illness		Emancipation from Home		Psychological and Social Maturity		Interest in Activities		Smoking and Use of Alcohol		School and Job Activities		Leadership		Participation in Athletics		Attitude toward Rough Sports		Evidence of Depression		Emotionality - Stable or Excitable		Evidence of Apprehensiveness		Evidence of Chronic Tension or Anxiety		Presence of Concomitants of Anxiety		Physical Fear		Total Score		Stress Score	
		E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K	E	K
01	1*	3	2	3	3	4	3	3	3	3	3	3	3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	2	2	2	51	48	26	25
01	2*	4	4	3	4	4	3	3	2	3	4	4	4	4	4	3	4	3	4	3	5	4	5	4	4	3	4	3	4	2	4	3	2	3	2	3	2	4	3	63	68	27	27
01	3*	2	2	3	2	3	3	3	2	1	2	4	3	4	4	3	2	2	4	3	2	2	3	2	2	2	2	4	2	2	3	3	3	3	3	4	2	4	3	54	49	27	22
01	4*	3	3	4	3	3	3	2	2	3	3	3	3	3	4	3	3	3	3	3	3	3	4	2	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3	57	58	28	26
01	5*	3	3	4	3	3	3	3	4	3	3	3	3	3	4	3	4	3	4	3	3	4	4	3	4	4	4	3	2	4	4	4	4	4	4	3	4	3	4	63	68	31	32
01	6*	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	3	4	3	5	3	3	3	5	4	5	4	4	3	4	3	4	3	4	3	4	3	4	66	78	30	36
02	1	3	4	4	5	3	5	3	5	3	4	3	4	4	3	4	4	4	4	3	4	4	4	3	5	3	4	3	4	4	4	3	4	3	4	3	4	4	5	64	80	30	39
02	2	4	3	4	3	3	3	4	4	3	4	3	3	3	4	4	3	3	4	3	2	3	3	3	3	3	3	4	3	3	3	3	2	3	2	3	3	3	3	62	58	30	27
02	3	3	3	3	3	3	3	3	2	3	2	3	2	4	4	3	2	3	3	3	2	4	3	3	3	3	3	3	2	4	2	3	3	3	3	3	4	3	3	60	52	28	24
02	4	3	4	4	4	3	4	4	4	3	4	3	4	3	4	4	5	4	2	3	4	4	5	3	5	4	4	3	4	3	4	3	5	3	5	3	5	3	4	63	80	29	39
02	5*	3	3	3	3	3	3	3	2	2	2	3	4	2	4	3	4	3	3	2	3	2	3	3	3	3	4	3	3	2	4	3	3	3	4	3	4	3	3	52	62	25	28
02	6	3	3	3	4	3	3	4	4	3	4	3	4	2	4	3	3	3	4	3	3	3	3	3	3	3	3	3	4	3	4	3	3	3	4	3	4	3	4	57	68	28	35
03	1	3	4	3	3	2	3	2	3	3	4	3	4	3	4	3	3	4	4	2	4	3	4	3	4	3	3	3	4	4	4	3	4	4	4	3	4	3	4	57	71	28	34
03	2	3	3	4	3	4	3	3	3	3	4	3	3	2	3	3	4	2	2	3	4	4	4	3	4	3	3	3	4	4	3	3	3	3	4	4	4	3	4	60	65	30	32
03	3	2	4	2	4	3	4	4	3	2	4	4	4	4	4	3	3	3	4	2	4	3	4	3	3	3	4	2	4	3	4	3	3	3	3	3	3	3	2	55	68	25	30
03	4	2	3	4	4	3	3	3	3	3	4	4	4	4	4	3	3	3	4	2	4	3	4	3	4	3	3	3	4	3	4	4	4	3	3	3	4	3	3	59	69	29	33
03	5	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	2	2	3	3	2	3	3	3	2	3	3	3	2	3	3	2	3	2	2	3	3	2	51	53	25	24
03	6	3	4	4	4	3	3	3	3	3	4	3	4	4	4	3	3	3	3	3	4	4	4	4	4	3	4	4	4	4	4	3	4	3	4	3	4	3	4	63	72	30	35
04	1	3	3	3	3	3	3	4	3	3	4	3	3	3	3	2	4	3	3	2	4	3	4	3	4	2	3	3	3	3	3	3	3	3	4	3	4	3	3	55	64	28	30
04	2	4	4	3	3	3	3	4	4	3	3	3	4	4	4	4	4	3	4	4	4	4	4	3	4	3	4	3	3	3	4	3	4	3	4	2	4	3	4	62	72	27	33
04	3	4	5	3	4	3	4	4	4	3	4	4	4	3	4	4	4	3	4	3	4	3	4	3	5	3	4	4	4	3	4	3	4	3	4	3	4	3	5	62	79	29	37
04	4*	3	3	3	3	3	4	2	3	2	4	3	4	3	4	3	4	2	4	3	4	3	3	3	4	3	4	3	4	3	4	3	4	4	4	4	4	4	3	57	71	28	33
04	5	4	4	4	3	3	4	3	4	3	4	4	4	4	5	3	4	3	3	3	4	3	4	4	5	4	4	4	4	3	4	3	3	3	4	3	4	4	4	65	75	30	34
04	6	4	3	3	4	3	3	4	4	4	4	3	4	3	4	3	3	3	3	4	3	3	4	3	3	4	3	3	4	3	4	3	4	3	4	3	4	3	4	62	69	29	36
05	1	3	4	3	3	3	4	4	4	3	4	4	3	3	3	3	3	2	3	3	4	3	3	3	4	3	4	4	3	4	4	3	4	3	3	3	4	3	4	60	68	30	33
05	2*	2	3	3	4	3	3	3	4	3	4	3	3	3	3	3	3	2	4	3	3	3	3	3	3	4	3	3	4	3	3	3	4	3	4	3	4	4	4	57	66	28	35
05	3*	2	3	3	3	2	3	3	3	2	3	3	4	2	3	2	3	3	4	2	3	3	4	2	3	3	3	2	4	3	3	3	4	3	3	3	3	2	2	48	61	24	28
05	4	3	4	3	4	3	4	3	3	3	4	3	4	4	5	4	4	3	5	4	3	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	5	60	77	27	36
05	5	3	4	4	4	3	4	3	4	3	4	3	4	4	4	3	4	3	3	3	4	4	5	3	3	3	3	4	4	3	4	3	5	3	4	3	4	4	5	62	76	30	38
05	6	4	5	3	4	4	4	3	3	3	4	3	4	3	3	3	4	3	4	4	4	4	4	4	4	4	4	3	4	3	5	3	5	3	4	3	4	4	5	64	78	28	38
06	1	3	3	3	3	3	4	4	3	3	4	3	4	4	4	4	4	4	4	3	4	3	4	3	4	3	4	3	4	4	4	3	4	3	4	3	4	3	4	62	73	29	34
06	2	3	3	3	2	3	3	3	3	3	4	3	3	3	3	3	[illegible]	3	3	3	4	3	3	3	4	3	4	2	3	2	3	3	3	3	4	3	3	3	4	55	63	25	29
06	3	4	4	3	5	4	4	3	4	3	4	4	4	4	4	3	5	2	5	3	5	3	4	3	5	3	4	3	5	3	4	3	4	3	5	3	4	3	5	60	84	27	40
06	4	3	4	3	4	4	3	4	4	3	4	4	4	3	4	3	3	3	4	3	3	3	4	2	3	3	2	3	4	3	4	3	4	3	4	3	4	3	3	59	69	28	35
06	5	4	4	3	4	3	4	3	4	3	4	4	4	3	4	3	5	3	4	3	5	3	3	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	59	77	27	36
06	6	3	3	3	4	3	3	3	3	3	3	3	3	3	4	4	3	3	4	4	4	3	4	3	4	3	4	4	4	3	4	3	4	3	4	3	4	3	4	60	70	28	34
07	1*	3	3	3	3	3	3	3	4	3	2	3	4	3	4	3	3	3	3	3	4	3	3	3	3	3	3	3	4	2	3	2	3	3	3	3	2	3	2	55	59	25	26
07	2*	3	3	3	3	3	4	3	4	3	4	3	4	3	3	3	4	3	3	3	3	3	3	3	4	3	3	3	3	3	4	3	4	3	4	3	4	3	4	57	68	27	34
07	3	4	4	4	5	4	4	4	4	3	3	3	4	4	5	3	4	3	3	4	3	4	4	3	4	3	3	4	5	3	5	3	3	3	3	3	3	4	3	66	72	31	34
07	4*	4	4	4	4	4	4	3	4	3	4	4	5	4	4	3	4	3	3	4	4	4	4	3	5	4	5	3	4	3	4	3	4	3	4	3	4	3	4	65	78	28	36
07	5	4	3	4	3	4	4	3	4	3	4	4	5	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	4	3	4	3	4	3	4	3	4	63	68	29	34
07	6	4	4	3	4	4	4	4	4	3	4	4	4	3	4	4	4	3	4	3	4	3	4	4	5	3	4	3	4	3	4	3	3	3	4	3	3	4	4	64	75	29	34
08	1	3	4	4	4	3	4	3	3	3	3	3	4	3	3	3	4	3	5	3	4	3	3	3	5	3	4	3	4	3	4	3	4	4	4	3	3	4	4	60	73	30	33
08	2	3	3	4	3	3	3	3	3	3	4	3	4	4	4	4	4	3	4	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	60	63	28	29
08	3	4	4	3	3	4	3	4	4	4	4	3	4	3	3	4	5	3	4	3	4	3	3	4	4	4	4	3	3	3	4	3	4	3	2	3	4	3	4	64	70	29	32
08	4	4	4	4	3	3	4	4	4	3	5	4	5	4	5	3	4	3	4	4	4	3	3	3	4	3	5	3	4	3	5	3	4	3	4	3	5	4	4	64	80	30	38
08	5*	4	4	3	4	3	4	2	3	4	4	2	4	4	4	3	4	3	4	3	4	3	5	2	4	3	4	3	3	3	4	3	4	3	4	3	4	3	5	57	76	27	35
08	6*	3	3	3	4	4	4	3	3	3	3	3	4	2	4	4	3	3	3	3	3	3	4	3	3	4	3	3	4	3	4	3	3	3	3	4	4	4	4	61	66	29	32
09	1*	3	4	3	5	4	5	4	4	3	4	3	5	4	4	4	4	3	5	3	4	4	4	4	4	3	5	3	4	4	4	4	5	3	4	3	4	4	4	66	82	31	38
09	2	3	4	3	3	3	4	4	4	4	4	3	5	3	5	3	4	3	4	3	4	3	4	3	5	3	4	3	4	3	4	3	3	3	3	3	3	3	4	59	75	29	32
09	3*	3	3	3	3	3	3	3	2	4	4	3	4	3	4	4	2	3	3	3	3	4	3	3	3	4	2	3	3	3	3	3	3	3	3	3	3	3	4	61	58	28	28
09	4*	4	5	4	4	4	4	3	3	4	4	4	5	4	4	4	4	3	3	4	5	3	4	4	5	4	4	4	4	4	4	4	5	3	4	3	4	4	4	71	79	33	36
09	5	4	4	4	4	4	4	4	3	3	3	4	3	3	4	3	4	3	4	3	4	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	2	3	4	67	71	31	32
09	6*	3	3	4	4	4	3	3	2	4	4	4	3	4	4	3	2	3	5	3	2	3	4	3	3	3	2	3	3	3	3	3	3	3	4	3	4	3	4	62	62	29	31
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08	4	4	4	4	3	3	4	4	4	3	3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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08	6*	3	3	3	4	4	4	3	3	3	3	3	4	2	4	4	3	3	3	3	3	3	4	3	3	4	3	3	4	3	4	3	3	3	3	4	4	4	4	61	66	29	32
09	1*	3	4	3	5	4	5	4	4	3	4	3	5	4	4	4	4	3	5	3	4	4	4	4	4	3	5	3	4	4	4	4	5	3	4	3	4	4	4	66	82	31	38
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09	3*	3	3	3	3	3	3	3	2	4	4	3	4	3	4	[illegible]	2	3	3	3	3	4	3	3	3	4	2	3	3	3	3	3	3	3	3	3	3	3	4	61	58	28	28
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09	5	4	4	4	4	4	4	4	3	3	3	4	3	3	4	3	4	3	4	3	4	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	2	3	4	67	71	31	32
09	6*	3	3	4	4	4	3	3	2	4	4	4	3	4	4	3	2	3	5	3	2	3	4	3	3	3	2	3	3	3	3	3	3	3	4	3	4	3	4	62	62	29	31
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10	5	4	4	4	4	3	4	3	4	3	5	3	5	4	5	4	4	3	4	4	4	4	4	4	5	4	5	3	4	3	4	3	4	3	4	3	4	3	5	65	82	28	38
10	6	4	4	3	4	4	3	3	4	3	5	3	3	3	4	4	4	3	3	4	4	3	4	4	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	62	74	27	37
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11	3	3	4	4	4	3	4	3	2	3	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	3	4	2	3	3	3	4	3	3	4	4	69	68	31	29
11	4*	4	5	4	4	4	4	3	2	3	4	3	4	4	5	4	4	3	5	4	4	3	4	4	4	4	5	4	4	3	3	3	4	3	4	3	4	3	5	66	78	29	34
11	5	4	4	3	3	4	4	4	4	4	4	3	5	3	4	4	4	4	3	3	4	3	3	4	4	4	4	4	4	4	4	4	3	3	4	3	3	4	4	69	72	33	33
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12	1	3	3	3	3	3	3	4	3	4	3	4	4	3	5	3	4	3	4	3	3	4	3	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	61	61	20	26
12	2*	4	3	3	2	3	3	3	3	3	3	3	4	3	4	3	2	3	4	3	3	3	3	3	3	3	3	2	2	3	2	3	4	3	3	3	2	3	3	57	56	26	24
12	3	4	4	4	4	4	4	4	4	4	5	4	3	3	3	3	4	3	2	3	4	4	4	4	5	4	5	3	4	4	3	3	3	3	4	3	4	4	5	68	74	32	36
12	4	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	4	3	4	3	4	4	5	3	4	3	4	4	4	3	4	3	4	3	4	3	4	4	4	65	77	32	36
12	5	3	3	4	3	3	3	4	3	4	3	3	3	3	3	3	4	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	2	3	3	61	56	30	25
12	6	4	3	4	4	3	4	4	3	4	4	4	4	4	4	3	4	3	3	4	4	4	4	4	4	4	4	3	3	4	4	3	4	3	2	3	4	4	4	69	70	32	32
13	1	2	3	3	3	2	3	3	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	4	3	3	3	3	3	3	3	3	3	56	55	28	25
13	2	4	4	4	4	3	3	4	4	3	4	3	4	3	4	4	4	3	3	3	3	3	3	4	3	4	4	4	4	4	4	4	4	4	4	3	4	3	4	65	72	33	36
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13	4	3	4	3	4	3	4	3	4	3	4	3	4	3	5	3	4	3	5	3	4	3	3	3	4	3	4	3	4	3	3	3	4	3	4	3	4	4	4	58	76	28	35
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14	2	3	4	3	4	3	5	3	4	3	4	4	4	3	4	4	3	3	4	3	3	3	3	3	5	3	4	3	4	4	4	3	4	3	4	3	4	3	4	60	75	28	36
14	3*	3	3	4	4	3	4	3	2	3	4	3	4	4	4	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	4	59	64	28	30
14	4	3	3	3	3	4	3	3	4	3	3	3	4	3	3	3	4	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	58	61	27	29
14	5*	3	4	3	4	3	4	3	4	3	4	3	4	3	3	3	5	3	3	3	4	3	4	3	5	4	5	3	4	3	4	3	3	3	4	3	3	3	4	58	75	27	34
14	6*	4	4	4	3	3	4	4	3	4	4	4	5	3	4	3	4	3	4	3	3	3	3	3	4	3	4	4	3	4	3	3	3	3	3	3	4	4	4	65	69	33	30
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15	6	4	3	3	3	3	3	4	4	4	4	3	3	3	3	4	3	4	3	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	63	61	29	30
16	1	3	3	3	4	4	4	4	4	3	4	3	3	3	3	3	3	3	2	3	4	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	59	62	28	30
16	2	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	3	3	3	3	4	3	3	3	4	3	4	3	4	3	3	3	4	3	4	3	4	57	72	27	35
16	3*	3	3	3	3	4	4	3	3	3	4	4	3	4	4	3	2	2	4	3	2	4	4	3	2	3	2	3	3	3	3	3	2	3	3	3	3	3	3	60	57	27	27
16	4	4	5	4	4	4	4	3	2	3	4	4	4	4	4	3	4	3	4	3	4	3	3	4	5	4	5	4	4	3	4	3	4	3	4	3	4	3	4	65	76	29	34
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16	6	4	4	4	4	4	4	4	4	3	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	3	4	3	4	3	5	4	4	3	4	3	4	4	5	68	78	31	38
17	1	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	3	3	4	3	4	3	3	3	3	3	4	3	3	3	2	3	2	3	3	3	2	3	3	57	58	27	25
17	2	4	4	3	3	3	3	4	4	3	4	3	4	3	4	3	3	3	4	3	4	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	2	59	64	28	28
17	3	3	4	4	4	3	4	3	4	3	4	3	4	4	4	4	4	3	4	4	4	4	4	4	5	4	4	3	4	4	4	3	4	3	4	3	4	3	4	65	77	29	36
17	4	3	4	4	4	4	3	3	3	3	4	4	4	4	4	4	3	3	4	3	4	4	4	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	4	64	68	28	30
17	5	4	4	4	4	3	3	4	5	3	3	3	4	4	4	3	4	3	4	3	4	3	3	4	4	4	4	4	4	3	4	3	4	3	4	3	4	3	3	64	73	30	35
17	6*	4	5	4	4	3	4	4	4	3	4	3	5	3	3	3	5	3	3	4	5	4	5	4	5	4	5	4	4	3	5	3	4	3	4	3	4	4	5	66	83	31	38
18	1*	4	4	4	4	3	3	4	4	4	4	3	4	3	3	3	3	4	4	3	3	4	3	3	3	3	3	3	3	3	4	3	4	3	4	4	4	3	4	64	68	31	35
18	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	3	3	3	4	4	4	4	4	4	3	4	4	4	4	4	3	4	3	3	4	4	3	4	3	3	3	3	4	3	3	3	4	3	3	3	4	3	3	4	66	67	32	31
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18	5	4	4	4	4	3	4	3	4	3	3	4	5	4	4	4	4	3	3	3	4	4	4	3	4	4	4	3	4	3	4	3	4	3	4	3	4	4	4	65	75	29	35
18	6	3	3	3	3	3	4	3	2	3	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	3	3	4	3	3	3	3	58	59	27	27
19	1	3	4	3	4	3	4	3	4	4	4	3	4	4	4	3	4	3	4	3	4	3	3	3	4	3	4	3	3	3	4	3	4	3	4	3	4	3	4	59	74	28	35
19	2	4	4	4	4	4	4	3	4	3	4	4	4	4	4	3	5	4	4	3	4	4	4	4	5	4	4	3	4	4	4	3	4	3	4	3	4	3	4	67	78	29	36
19	3*	3	3	3	3	3	4	4	3	3	3	4	4	3	5	3	3	3	4	3	4	3	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	4	59	65	28	28
19	4*	3	2	3	3	4	2	3	2	3	2	4	2	3	4	3	4	3	3	3	3	3	3	3	3	3	3	2	4	3	2	3	2	3	3	3	2	3	3	58	52	26	23
19	5	3	2	3	3	3	3	4	4	3	4	3	3	3	3	3	4	3	3	3	3	3	4	3	3	3	3	3	3	3	2	3	2	3	2	3	3	3	2	58	56	28	25
19	6	3	4	3	4	4	4	4	4	3	4	3	4	3	3	4	4	3	3	3	4	4	4	3	4	3	4	4	4	3	4	3	4	3	4	3	4	3	4	62	74	29	36
20	1	4	3	4	3	4	3	3	2	3	4	4	3	4	4	4	4	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	4	63	60	28	27
20	2	3	4	4	4	3	3	3	3	4	4	4	4	3	3	3	4	3	4	3	4	4	4	3	4	4	4	3	4	4	3	3	4	3	4	3	4	4	4	64	72	31	34
20	3*	3	3	3	3	3	3	4	4	3	4	4	3	3	4	3	3	3	3	3	4	3	3	3	3	4	3	4	3	3	3	3	3	3	3	3	3	3	2	61	60	29	28
20	4	3	4	4	3	3	4	3	3	3	4	4	4	3	4	3	4	3	3	3	4	3	3	3	5	4	4	3	3	3	4	3	4	3	4	3	4	3	4	60	72	28	33
20	5	3	4	4	3	3	3	3	4	3	4	4	4	4	4	3	4	3	4	3	4	4	5	3	4	3	3	4	4	4	4	3	3	3	3	3	4	3	4	63	72	30	33
20	6	3	3	3	2	3	3	3	2	3	2	3	*3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	57	55	27	24

*Subject not included in analysis.

- Indicates no data.

Table D-6

Summary of Variables for Personal Interview Study With Their Means and Standard Deviations
Population = 119

Variable No.	Description of Variable	Unit of Measurement	Mean	Standard Deviation
01	Appearance and Manner (E)	4-Point Scale	3.361	± 0.576
02	Appearance and Manner (K)	4-Point Scale	3.622	± 0.648
03	Assuredness - Uncertainty (E)	4-Point Scale	3.445	± 0.514
04	Assuredness - Uncertainty (K)	4-Point Scale	3.571	± 0.616
05	Motivation or Ambition (E)	4-Point Scale	3.319	± 0.518
06	Motivation or Ambition (K)	4-Point Scale	3.613	± 0.567
07	Family History (E)	4-Point Scale	3.353	± 0.574
08	Family History (K)	4-Point Scale	3.395	± 0.812
09	Illness (E)	4-Point Scale	3.126	± 0.477
10	Illness (K)	4-Point Scale	3.731	± 0.644
11	Emancipation from Home (E)	4-Point Scale	3.378	± 0.502
12	Emancipation from Home (K)	4-Point Scale	3.832	± 0.613
13	Psychological and Social Maturity (E)	4-Point Scale	3.319	± 0.579
14	Psychological and Social Maturity (K)	4-Point Scale	3.790	± 0.592
15	Interest in Activities (E)	4-Point Scale	3.252	± 0.489
16	Interest in Activities (K)	4-Point Scale	3.664	± 0.677
17	Smoking and Use of Alcohol (E)	4-Point Scale	3.017	± 0.410
18	Smoking and Use of Alcohol (K)	4-Point Scale	3.529	± 0.696
19	School and Job Activities (E)	4-Point Scale	3.160	± 0.485
20	School and Job Activities (K)	4-Point Scale	3.622	± 0.648
21	Leadership (E)	4-Point Scale	3.277	± 0.517
22	Leadership (K)	4-Point Scale	3.613	± 0.662
23	Participation in Athletics (E)	4-Point Scale	3.160	± 0.485
24	Participation in Athletics (K)	4-Point Scale	3.782	± 0.758
25	Attitude Toward Rough Sports (E)	4-Point Scale	3.244	± 0.502
26	Attitude Toward Rough Sports (K)	4-Point Scale	3.613	± 0.711
27	Evidence of Depression (E)	4-Point Scale	3.202	± 0.495
28	Evidence of Depression (K)	4-Point Scale	3.529	± 0.646
29	Emotionality - Stable or Excitable (E)	4-Point Scale	3.168	± 0.491
30	Emotionality - Stable or Excitable (K)	4-Point Scale	3.588	± 0.679
31	Evidence of Apprehensiveness (E)	4-Point Scale	3.076	± 0.295
32	Evidence of Apprehensiveness (K)	4-Point Scale	3.479	± 0.696
33	Evidence of Chronic Tension or Anxiety (E)	4-Point Scale	3.050	± 0.219
34	Evidence of Chronic Tension or Anxiety (K)	4-Point Scale	3.571	± 0.629
35	Presence of Concomitants of Anxiety (E)	4-Point Scale	3.067	± 0.310
36	Presence of Concomitants of Anxiety (K)	4-Point Scale	3.529	± 0.684
37	Physical Fear (E)	4-Point Scale	3.210	± 0.447
38	Physical Fear (K)	4-Point Scale	3.748	± 0.724
39	Total Score[1] (E)	Sum of Designated Variables	61.185	± 4.122
40	Total Score[2] (K)	Sum of Designated Variables	68.824	± 7.965
41	Stress Score[3] (E)	Sum of Designated Variables	28.698	± 1.881
42	Stress Score[4] (K)	Sum of Designated Variables	32.143	± 4.281
43	Masculinity Score[5] (E)	Sum of Designated Variables	19.420	± 1.934
44	Masculinity Score[6] (K)	Sum of Designated Variables	22.084	± 2.812
45	Masculinity Estimation - Grant Study	4-Point Scale	3.966	± 0.257
46	Masculine Component - Physical Examination	4-Point Scale	3.840	± 0.430
47	Age	Months	228.202	±20.649

[1] Sum of values for variables 01, 03, 05, 07, 09, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, and 37.
[2] Sum of values for variables 02, 04, 06, 08, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, and 38.
[3] Sum of values for variables 03, 07, 09, 27, 29, 31, 33, 35, and 37.
[4] Sum of values for variables 04, 08, 10, 28, 30, 32, 34, 36, and 38.
[5] Sum of values for variables 13, 15, 19, 21, 23, and 25.
[6] Sum of values for variables 14, 16, 20, 22, 24, and 26.

1

Intercorrelations anc
Population = 119; Signi

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19
01		-.02	.05	-.09	.02	-.01	.04	-.08	-.06	-.08	-.04	-.06	-.04	-.05	-.08	-.07	-.04	-.09	.01
02	.46		-.01	-.07	.01	.06	-.06	-.02	-.04	.02	-.01	.12	-.08	-.04	-.03	.01	-.02	-.01	-.06
03	.31	.30		-.05	.01	.02	.02	.07	.10	.06	.07	.12	.00	.04	-.08	.05	.04	-.18	.00
04	.22	.56	.31		.10	.03	-.04	-.02	.02	.02	-.08	.01	-.12	.02	-.05	-.02	.00	-.05	-.04
05	.43	.19	.19	.32		.06	.10	.03	-.03	-.01	.10	-.16	.03	-.12	.02	.04	-.09	.06	-.02
06	.22	.54	.16	.51	.16		.00	-.01	.07	.06	.01	.15	.00	-.13	.05	.00	.04	-.08	.08
07	.25	.16	.09	.17	.22	.11		-.03	.03	.04	.13	-.03	-.16	.01	.12	-.10	.06	-.08	.00
08	.03	.33	.10	.36	.08	.33	.44		.02	.08	-.12	.08	.04	-.02	.10	-.05	-.08	-.02	.09
09	.39	.18	.18	.16	.14	.03	.24	.11		.12	-.06	.07	-.07	-.12	-.12	-.08	-.03	-.04	-.05
10	.22	.44	.21	.37	.08	.41	.17	.36	.27		.09	.05	.04	-.12	.05	-.15	-.09	.03	-.01
11	.08	.16	.26	.12	.22	.19	.15	-.14	-.24	.16		-.04	.01	-.04	-.10	-.10	-.07	-.11	-.12
12	.32	.54	.24	.32	.04	.52	.07	.30	.13	.35	.10		-.03	-.05	.00	.03	.09	.03	-.08
13	.16	.28	.37	.29	.17	.25	-.18	.02	-.23	.16	.34	.22		.05	-.04	.05	.08	-.02	.03
14	.12	.21	.14	.10	-.20	.13	.02	-.01	-.20	.03	.24	.30	.44		.05	-.03	.01	-.03	.04
15	.21	.27	.16	.25	.15	.20	.16	.11	.12	.22	.02	.20	.22	.24		.00	.16	-.05	.06
16	.36	.48	.24	.32	.16	.32	.13	.27	.13	.26	.00	.35	.12	.08	.18		-.07	-.03	-.01
17	.22	.25	.20	.16	-.07	.14	.19	.08	.29	.14	-.11	.25	.12	.05	.32	.23		-.03	-.13
18	.01	.28	.02	.24	-.03	.14	-.01	.05	-.07	.15	.13	.21	.37	.43	.15	.06	.03		-.16
19	.37	.25	.25	.26	.23	.19	.19	.20	.24	.16	-.01	.12	.27	.15	.29	.16	.03	.00	
20	.34	.54	.08	.35	.16	.33	.11	.30	.10	.36	.08	.37	.14	-.01	.09	.53	.18	.07	.14
21	.23	.34	.42	.37	.17	.19	.12	.14	.27	.20	.08	.20	.27	.08	.19	.22	.26	.04	.23
22	.19	.38	.26	.46	.19	.25	.01	.19	.13	.25	-.02	.25	.19	.07	.07	.27	.18	.03	.14
23	.40	.43	.22	.29	.23	.23	.16	.08	.20	.27	.13	.20	.24	.15	.29	.39	.20	.05	.32
24	.34	.65	.29	.41	.07	.49	.06	.32	.15	.43	.11	.43	.16	.14	.26	.61	.23	.14	.14
25	.28	.41	.30	.28	.15	.18	.05	.16	.26	.23	.13	.24	.17	.14	.26	.32	.23	.04	.29
26	.38	.65	.24	.39	.08	.48	.11	.25	.05	.36	.03	.43	.20	.17	.28	.64	.20	.19	.20
27	.25	.32	.37	.20	.14	.19	.22	.20	.04	.09	.13	.14	.22	.17	.17	.08	-.02	.00	.29
28	.21	.52	.18	.63	.25	.33	.13	.42	.03	.28	.11	.33	.09	.20	.16	.39	.09	.16	.13
29	-.01	.20	.27	.18	-.05	.20	.09	.09	.23	.20	.08	.01	.14	.01	.17	.09	.24	.06	.10
30	.30	.56	.16	.44	.11	.42	.11	.39	.03	.30	-.01	.48	.16	.16	.14	.41	.09	.12	.20
31	.09	.11	.22	.18	.17	.13	.19	.12	.11	.15	.09	.16	.11	.04	.22	.13	.13	.01	.03
32	.16	.53	.25	.44	-.01	.36	.04	.31	.10	.27	-.01	.41	.18	.10	.19	.29	.15	.24	.20
33	-.01	.02	.10	-.03	-.14	-.05	-.14	.03	-.14	-.02	-.17	.00	-.13	-.05	.04	.04	.08	.10	-.16
34	.15	.47	.20	.44	.06	.38	-.09	.25	-.02	.30	.01	.32	.12	.14	.11	.31	.16	.19	.09
35	-.04	-.04	.13	.06	.18	.10	.06	.03	-.06	.05	.11	.02	-.03	-.02	.00	-.01	-.08	-.01	.04
36	.15	.47	.24	.40	-.05	.33	.08	.35	.16	.40	.00	.31	.15	.15	.18	.31	.15	.08	.13
37	.20	.30	.22	.27	.15	.32	.07	.10	.07	.14	.17	.28	.23	.17	.14	.23	.03	.16	.19
38	.38	.57	.35	.46	.19	.48	.01	.21	.29	.41	.03	.34	.29	.19	.37	.44	.21	.25	.38
39	.60	.56	.62	.49	.46	.38	.41	.28	.43	.37	.34	.35	.48	.25	.49	.38	.37	.12	.52
40	.40	.82	.33	.68	.17	.64	.16	.52	.16	.57	.11	.63	.32	.29	.31	.62	.25	.34	.27
41	.37	.40	.64	.37	.26	.29	.51	.32	.45	.31	.21	.26	.23	.12	.28	.26	.27	.05	.33
42	.33	.70	.32	.71	.16	.56	.18	.60	.18	.58	.05	.50	.23	.17	.27	.48	.20	.23	.28
43	.42	.52	.46	.46	.29	.33	.16	.17	.28	.33	.20	.31	.60	.33	.58	.35	.30	.19	.62
44	.42	.71	.31	.50	.16	.50	.11	.33	.12	.42	.10	.52	.29	.32	.27	.77	.26	.21	.22
45	-.15	-.08	-.01	.02	-.17	-.09	-.15	-.10	-.24	-.16	-.03	-.04	.07	.06	-.07	-.07	-.15	.19	.04
46	-.04	.18	.06	.19	-.07	.09	.20	.08	.18	.03	.05	-.01	.07	-.03	.07	.13	.16	.03	.04
47	.04	.05	.09	-.04	-.05	.12	-.02	-.06	.08	.04	.12	.09	.10	.37	-.01	-.09	-.03	.32	.00

Table D-7

Intercorrelations and Residuals for Variables from Personal Interview Study
Population = 119; Significance Levels: $P = 0.05, |r| \geq 0.19$; $P = 0.01, |r| \geq 0.25$

Residuals

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
07	-.04	-.09	.01	-.06	-.09	-.11	-.05	-.12	-.11	-.09	.01	.03	-.01	-.01	-.09	-.13	.04	-.06	-.05	.00	-.13
01	-.02	-.01	-.06	.04	-.08	-.10	.04	.04	.02	.14	.03	.07	.02	.03	-.09	-.02	.01	.02	-.06	.05	-.03
05	.04	-.18	.00	-.09	.09	.01	-.01	.07	.08	.07	.11	.04	.07	.04	-.06	.05	.13	.06	.04	.10	.03
02	.00	-.05	-.04	-.08	-.07	-.08	-.01	-.06	.01	.04	-.07	.06	.04	-.08	-.04	-.05	.02	.00	-.05	.00	-.01
04	-.09	.06	-.02	.02	-.03	.06	-.06	.00	-.05	-.12	-.06	.14	-.03	-.05	.13	-.05	.00	.01	.07	-.04	-.03
00	.04	-.08	.08	-.11	-.05	-.08	-.07	-.01	-.09	.06	-.02	-.14	.07	-.07	.09	-.08	-.08	-.01	.07	-.02	.05
10	.06	-.08	.00	-.09	.02	-.08	.04	-.09	.01	.08	.05	-.02	.18	-.04	.05	-.05	-.14	-.08	.04	.03	-.02
05	-.08	-.02	.09	-.02	-.02	-.03	-.09	-.03	.02	.05	-.01	.07	-.02	-.03	.02	-.03	-.03	.04	.01	.05	-.05
08	-.03	-.04	-.05	.05	-.02	-.08	-.10	-.01	-.03	-.07	.00	.05	-.05	.02	-.05	.00	-.19	-.04	-.03	.15	-.11
15	-.09	.03	-.01	-.04	-.10	-.05	-.06	-.07	-.12	-.04	-.11	.01	-.07	-.07	.07	-.14	-.05	-.01	.09	.09	-.10
10	-.07	-.11	-.12	-.12	-.05	-.09	-.05	-.03	.02	-.08	-.02	-.06	.09	-.08	.07	-.04	-.08	-.04	.06	.02	.02
.03	.09	.03	-.08	.06	-.01	.02	-.16	.01	-.06	-.07	-.04	.14	-.11	.08	.10	.03	.07	.03	.06	.03	.06
05	.08	-.02	.03	.03	.00	-.04	.04	-.03	-.01	-.03	-.04	-.11	.06	-.03	-.09	-.04	-.05	-.11	-.14	-.03	.03
03	.01	-.03	.04	-.11	-.01	.03	-.12	-.09	-.06	-.11	.03	.10	-.12	.03	.01	-.05	-.08	-.01	-.01	.07	-.08
00	.16	-.05	.06	-.06	-.09	-.17	.03	.03	.02	.06	.04	.05	.00	.00	.08	.00	.09	-.05	-.01	.07	-.04
	-.07	-.03	-.01	-.08	-.10	-.04	-.03	-.03	-.06	.18	-.13	.09	-.12	.04	-.03	-.12	.05	.09	.10	.06	-.02
23		-.03	-.13	.00	.00	-.02	-.05	-.10	-.03	-.05	-.16	.07	-.09	-.07	-.13	-.12	.02	.03	-.02	-.05	-.11
06	.03		-.16	-.04	-.15	-.13	-.09	-.05	-.09	.07	-.14	-.02	-.02	.01	-.09	.08	.10	.03	-.04	-.03	-.01
16	.03	.00		-.01	-.10	-.07	.03	-.04	-.01	.02	.08	.07	-.02	.07	.05	.05	.01	-.05	.04	.03	.04
.53	.18	.07	.14		-.07	-.02	.00	-.03	-.01	.17	-.02	-.03	.06	-.06	.07	-.02	.07	.01	.03	-.02	-.02
22	.26	.04	.23	.21		.18	-.04	-.06	-.05	-.03	-.19	.00	-.06	-.05	-.06	-.03	.02	-.03	-.02	.01	.01
27	.18	.03	.14	.33	.53		-.13	-.11	-.12	-.10	-.06	.08	-.11	-.01	-.06	-.13	-.05	-.09	-.03	-.03	-.06
39	.20	.05	.32	.38	.36	.11		.02	.02	.06	-.02	.07	-.17	.00	.11	-.07	.00	-.02	-.03	.05	.02
61	.23	.14	.14	.65	.31	.32	.46		-.02	.15	-.09	.02	.00	-.04	-.04	-.12	.05	.05	-.02	.02	-.07
32	.23	.04	.29	.34	.35	.16	.50	.43		.01	-.08	.09	-.14	-.02	.05	.01	.02	-.02	.11	.06	-.03
64	.20	.19	.20	.61	.27	.24	.50	.75	.43		-.08	.13	-.08	-.06	.02	-.10	.06	.03	-.10	.02	-.01
08	-.02	.00	.29	.16	.08	.11	.25	.16	.17	.15		.00	-.04	.00	-.05	-.07	-.04	-.04	-.08	.02	-.01
39	.09	.16	.13	.44	.21	.44	.24	.44	.25	.39	.17		.09	.07	.01	.05	-.03	.06	-.09	.11	-.02
09	.24	.06	.10	.07	.35	.07	.24	.26	.28	.16	.21	.06		-.05	-.01	-.03	.03	.02	.05	.04	-.11
41	.09	.12	.20	.37	.18	.38	.25	.50	.25	.44	.22	.54	.03		.07	.05	.02	-.02	.00	.09	.01
13	.13	.01	.03	.06	.08	.11	.21	.11	.05	.14	.13	.06	.26	.16		-.01	.08	.10	-.02	.03	-.01
29	.15	.24	.20	.36	.28	.29	.20	.47	.34	.41	.16	.41	.26	.60	.19		.02	.14	.05	.11	-.05
04	.08	.10	-.16	.02	-.05	-.04	-.08	.12	-.04	.07	-.02	.05	.16	.08	.33	.12		.02	-.03	-.02	-.03
31	.16	.19	.09	.28	.21	.27	.14	.47	.25	.42	.14	.43	.15	.45	.03	.62	.10		.01	.13	-.08
01	-.08	-.01	.04	-.08	-.01	.00	-.07	-.12	.06	-.15	.02	.03	.04	.05	.13	.05	.07	.06		.00	.05
31	.15	.08	.13	.21	.23	.30	.18	.45	.29	.40	.21	.39	.26	.56	.18	.63	.10	.59	.03		.02
23	.03	.16	.19	.25	.26	.16	.35	.26	.26	.28	.23	.26	.11	.26	.14	.19	.06	.14	.14	.19	
44	.21	.25	.38	.33	.37	.36	.33	.53	.35	.51	.24	.32	.26	.46	.17	.49	.03	.57	.08	.52	.32
38	.37	.12	.52	.34	.57	.31	.62	.45	.57	.44	.47	.32	.44	.33	.37	.35	.00	.24	.15	.33	.46
62	.25	.34	.27	.63	.39	.51	.41	.78	.43	.74	.26	.68	.22	.72	.19	.69	.06	.66	.01	.67	.36
26	.27	.05	.33	.20	.40	.20	.39	.32	.35	.26	.57	.24	.57	.26	.50	.31	.18	.17	.28	.34	.48
48	.20	.23	.28	.48	.35	.46	.31	.64	.38	.57	.26	.70	.24	.75	.21	.76	.07	.73	.07	.77	.29
35	.30	.19	.62	.33	.63	.32	.70	.45	.66	.48	.31	.28	.33	.31	.18	.36	-.11	.25	-.01	.30	.37
77	.26	.21	.22	.76	.39	.54	.49	.86	.44	.84	.20	.56	.17	.55	.15	.47	.05	.47	-.09	.45	.33
07	-.15	.19	.04	-.08	-.06	.02	-.23	-.12	-.20	-.16	-.08	-.10	-.22	.02	.19	.09	.03	-.09	.03	.01	-.23
13	.16	.03	.04	.06	.16	.14	.08	.10	.03	.02	-.09	-.06	.05	.01	.03	.06	-.27	.03	-.17	.06	-.09
09	-.03	.32	.00	-.14	.03	-.03	.03	.07	.04	-.01	.02	-.13	.04	-.11	.05	.03	.17	.17	.07	.08	.06

3

.1 Interview Study
$P = 0.01, |r| \geq 0.25$

27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
.01	.03	-.01	-.01	-.09	-.13	.04	-.06	-.05	.00	-.13	-.12	.00	-.07	-.02	-.02	-.13	-.15	-.02	-.08	-.01
.03	.07	.02	.03	-.09	-.02	.01	.02	-.06	.05	-.03	-.03	-.02	.05	-.06	.03	-.07	.01	-.10	.00	-.02
.11	.04	.07	.04	-.06	.05	.13	.06	.04	.10	.03	.05	.09	.06	.18	.07	.01	.05	-.04	-.03	-.06
-.07	.06	.04	-.08	-.04	-.05	.02	.00	-.05	.00	-.01	-.05	-.08	-.03	-.09	.05	-.08	-.05	-.09	.02	-.06
-.06	.14	-.03	-.05	.13	-.05	.00	.01	.07	-.04	-.03	.01	.01	.04	-.01	.02	-.10	.01	.02	.01	.00
-.02	-.14	.07	-.07	.09	-.08	-.08	-.01	.07	-.02	.05	.09	.05	.02	.05	-.02	-.05	-.08	-.04	.05	.16
.05	-.02	.18	-.04	.05	-.05	-.14	-.08	.04	.03	-.02	-.05	.14	-.06	.17	-.03	.05	-.09	-.10	.09	.03
-.01	.07	-.02	-.03	.02	-.03	-.03	.04	.01	.05	-.05	.02	.05	.05	-.04	.10	.01	-.03	-.01	-.04	.07
.00	.05	-.05	.02	-.05	.00	-.19	-.04	-.03	.15	-.11	-.02	.11	-.01	.11	.04	.01	-.05	-.06	.08	-.02
-.11	.01	-.07	-.07	.07	-.14	-.05	-.01	.09	.09	-.10	.00	.01	.05	.02	.13	-.07	-.11	-.06	-.10	.05
-.02	-.06	.09	-.08	.07	-.04	-.08	-.04	.06	.02	.02	-.05	.04	-.07	.08	.00	-.07	-.11	-.03	.06	.04
-.04	.14	-.11	.08	.10	.03	.07	.03	.06	.03	.06	-.08	.00	.11	.09	.08	-.19	-.02	-.09	-.16	.00
-.04	-.11	.06	-.03	-.09	-.04	-.05	-.11	-.14	-.03	.03	-.03	-.01	-.05	-.08	-.07	.11	.00	-.11	-.01	-.19
.03	.10	-.12	.03	.01	-.05	-.08	-.01	-.01	.07	-.08	-.03	.01	-.05	.00	.00	-.02	-.06	.01	-.05	.02
.04	.05	.00	.00	.08	.00	.09	-.05	-.01	.07	-.04	.05	.10	.01	.03	.06	.18	-.02	-.11	-.05	-.17
-.13	.09	-.12	.04	-.03	-.12	.05	.09	.10	.06	-.02	.05	-.04	.07	-.09	.10	-.07	.10	.03	-.06	.06
-.16	.07	-.09	-.07	-.13	-.12	.02	.03	-.02	-.05	-.11	-.09	.06	-.03	-.08	-.06	-.01	-.05	-.14	-.02	-.09
-.14	-.02	-.02	.01	-.09	.08	.10	.03	-.04	-.03	-.01	.03	-.17	.00	-.15	.02	-.10	-.07	.05	-.07	.05
.08	.07	-.02	.07	.05	.05	.01	-.05	.04	.03	.04	.04	.03	.00	.05	.03	.16	-.02	.11	-.12	-.19
-.02	-.03	.06	-.06	.07	-.02	.07	.01	.03	-.02	-.02	-.03	-.03	.02	-.01	.09	-.03	.04	.04	-.08	.13
-.19	.00	-.06	-.05	-.06	-.03	.02	-.03	-.02	.01	.01	-.07	-.02	-.05	-.06	-.03	.06	.00	.04	-.01	-.10
-.06	.08	-.11	-.01	-.06	-.13	-.05	-.09	-.03	-.03	-.06	-.10	-.09	-.04	-.13	-.04	-.09	.07	-.02	-.01	-.04
-.02	.07	-.17	.00	.11	-.07	.00	-.02	-.03	.05	.02	-.06	.05	-.02	-.01	.03	.06	-.03	-.02	-.03	-.03
-.09	.02	.00	-.04	-.04	-.12	.05	.05	-.02	.02	-.07	-.04	-.01	.02	-.05	.04	-.05	.04	-.05	-.08	.16
-.08	.09	-.14	-.02	.05	.01	.02	-.02	.11	.06	-.03	-.11	.05	-.02	.02	.01	.09	-.04	.03	-.09	-.07
-.08	.13	-.08	-.06	.02	-.10	.06	.03	-.10	.02	-.01	-.04	.01	.11	-.01	.03	-.08	.17	-.12	-.09	-.03
	.00	-.04	.00	-.05	-.07	-.04	-.04	-.08	.02	-.01	-.03	-.03	-.05	.10	-.08	-.10	-.08	.08	-.07	-.07
.17		.09	.07	.01	.05	-.03	.06	-.09	.11	-.02	.03	.04	.09	-.03	.18	.07	.08	.00	.02	.03
.21	.06		-.05	-.01	-.03	.03	.02	.05	.04	-.11	-.03	.03	.01	.04	-.01	-.17	-.03	-.02	-.08	-.14
.22	.54	.03		.07	.05	.02	-.02	.00	.09	.01	-.02	.00	.04	-.02	.07	-.07	-.04	.04	-.05	-.03
.13	.06	.26	.16		-.01	.08	.10	-.02	.03	-.01	.04	.04	.03	-.12	.05	-.06	-.01	-.02	.00	-.01
.16	.41	.26	.60	.19		.02	.14	.05	.11	-.05	-.07	-.01	.00	-.04	.07	-.08	-.14	.05	-.10	.00
-.02	.05	.16	.08	.33	.12		.02	-.03	-.02	-.03	.02	.06	.00	-.04	-.05	.03	.03	.10	-.08	.18
.14	.43	.15	.45	.03	.62	.10		.01	.13	-.08	.08	-.03	.07	-.03	.10	-.07	.01	-.04	.01	.09
.02	.03	.04	.05	.13	.05	.07	.06		.00	.05	.08	.02	-.01	.06	-.03	-.03	-.02	.09	.03	.02
.21	.39	.26	.56	.18	.63	.10	.59	.03		.02	.07	.09	.11	.07	.14	.01	.02	-.04	-.04	.03
.23	.26	.11	.26	.14	.19	.06	.14	.14	.19		.01	.03	-.04	.08	-.03	-.01	-.07	-.03	.00	.00
.24	.32	.26	.46	.17	.49	.03	.57	.08	.52	.32		-.01	.02	.03	.04	-.07	-.05	-.10	-.05	-.07
.47	.32	.44	.33	.37	.35	.00	.24	.15	.33	.46	.55		.01	.03	.01	.00	-.02	-.03	-.01	-.12
.26	.68	.22	.72	.19	.69	.06	.66	.01	.67	.36	.71	.57		-.02	.10	-.05	.01	-.06	-.06	.01
.57	.24	.57	.26	.50	.31	.18	.17	.28	.34	.48	.42	.84	.43		-.06	-.07	-.05	-.07	.06	-.03
.26	.70	.24	.75	.21	.76	.07	.73	.07	.77	.29	.71	.52	.94	.44		-.03	.04	-.01	.01	-.09
.31	.28	.33	.31	.18	.36	-.11	.25	-.01	.30	.37	.55	.86	.55	.52	.48		-.07	-.04	-.09	-.18
.20	.56	.17	.55	.15	.47	.05	.47	-.09	.45	.33	.58	.53	.87	.33	.68	.55		-.06	-.08	.07
-.08	-.10	-.22	.02	.19	.09	.03	-.09	.03	.01	-.23	-.14	-.23	-.07	-.26	-.07	-.11	-.09		-.03	-.03
-.09	-.06	.05	.01	.03	.06	-.27	.03	-.17	.06	-.09	.11	.08	.10	.03	.08	.12	.10	.26		-.10
.02	-.13	.04	-.11	.05	.03	.17	.17	.07	.08	.06	.11	.08	.06	.11	-.01	.06	.03	.06	-.03	

Table D-8

Rotated Factor Loadings of Personal Interview Study
Population = 119

Variable No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	9	10	11	h^2*
01	Appearance and Manner (E)	-.11	.06	.54	-.04	.19	.10	-.02	.26	.44	.29	-.19	.74
02	Appearance and Manner (K)	.01	.06	.52	.15	.32	.09	.43	.18	.18	.05	.04	.66
03	Assuredness - Uncertainty (E)	-.03	.09	.22	.13	.18	.06	.05	.51	.00	-.09	.03	.38
04	Assuredness - Uncertainty (K)	.00	-.05	.36	.20	.09	.13	.68	.38	.10	-.02	.10	.82
05	Motivation or Ambition (E)	-.02	-.12	.20	-.18	-.11	-.08	.04	.46	.18	.41	-.06	.52
06	Motivation or Ambition (K)	.04	.05	.44	-.05	.17	.05	.47	-.02	-.09	.11	.13	.49
07	Family History (E)	.60	-.03	.19	.01	-.01	.13	.10	.09	.30	-.03	-.12	.54
08	Family History (K)	.60	-.19	.23	.00	.16	.08	.39	-.07	.11	.04	.09	.66
09	Illness (E)	-.11	-.14	.04	-.03	.16	.32	-.09	.08	.82	.02	.16	.88
10	Illness (K)	.04	-.07	.42	.02	.30	.01	.19	.00	.09	.05	.17	.35
11	Emancipation from Home (E)	.00	.30	.29	-.07	-.11	-.03	.08	.24	-.17	-.04	.04	.29
12	Emancipation from Home (K)	.04	.21	.40	.11	.20	-.09	.21	-.02	.09	.40	.10	.49
13	Psychological and Social Maturity (E)	-.08	.46	.20	.16	.14	-.05	.25	.44	-.16	.01	.00	.59
14	Psychological and Social Maturity (K)	.02	.77	.26	-.09	.19	.06	.08	-.11	-.05	.07	.15	.76
15	Interest in Activities (E)	-.14	.17	.21	.12	.11	.07	.10	.23	.21	.01	.11	.24
16	Interest in Activities (K)	.10	-.16	.69	.09	.20	.11	.02	-.01	.11	.02	.11	.60
17	Smoking and Use of Alcohol (E)	.05	-.09	.21	.18	.34	.14	-.09	.07	.21	.00	.14	.30
18	Smoking and Use of Alcohol (K)	.03	.51	.17	.09	.11	.08	.23	.11	.00	-.19	.08	.42
19	School and Job Activities (E)	.05	.12	.20	.03	.11	-.19	.09	.35	.39	.00	.06	.39
20	School and Job Activities (K)	.03	-.18	.84	-.01	.01	.03	.19	-.04	.00	-.08	.00	.78
21	Leadership (E)	-.06	-.03	.31	.06	.23	-.01	.15	.38	.21	-.08	.30	.47
22	Leadership (K)	-.13	-.11	.31	.17	.21	.10	.39	.19	.14	-.02	.08	.42
23	Participation in Athletics (E)	-.01	.08	.50	-.11	.14	.03	-.02	.21	.21	.21	.38	.57
24	Participation in Athletics (K)	-.02	-.09	.74	.09	.39	.10	.21	-.07	.04	.01	.10	.79
25	Attitude Toward Rough Sports (E)	-.10	.01	.42	-.11	.32	-.11	.03	.16	.22	.06	.31	.49
26	Attitude Toward Rough Sports (K)	-.12	.03	.53	.07	.38	-.03	.17	-.01	.04	.37	.10	.62
27	Evidence of Depression (E)	.19	.05	.22	-.12	.28	-.01	.08	.35	-.03	.05	.07	.32
28	Evidence of Depression (K)	.01	-.09	.39	-.16	.01	.21	.61	.06	-.08	-.08	-.02	.62
29	Emotionality - Stable or Excitable (E)	-.02	-.09	.01	-.01	.48	.14	-.11	.19	-.01	.00	.80	.95
30	Emotionality - Stable or Excitable (K)	-.07	-.11	.39	.03	.31	.01	.52	-.02	-.02	.25	-.03	.60
31	Evidence of Apprehensiveness (E)	.13	.00	.02	.34	.26	.63	-.11	.33	-.12	.14	-.01	.75
32	Evidence of Apprehensiveness (K)	-.02	-.10	.36	.20	.50	.04	.39	-.01	.00	.12	.09	.61
33	Evidence of Chronic Tension or Anxiety (E)	.01	-.05	-.11	-.13	.30	.39	.01	-.12	-.13	-.03	-.07	.31
34	Evidence of Chronic Tension or Anxiety (K)	-.16	-.02	.22	-.02	.43	-.08	.49	.00	.00	.03	-.02	.51
35	Presence of Concomitants of Anxiety (E)	.01	.03	-.15	-.17	.04	.18	.16	.24	-.09	.07	-.10	.19
36	Presence of Concomitants of Anxiety (K)	.01	-.11	.16	.16	.51	-.02	.40	-.02	-.06	.09	.02	.50
37	Physical Fear (E)	-.03	.11	.31	-.23	.21	.20	.14	.17	.07	.08	.10	.32
38	Physical Fear (K)	-.19	.04	.39	.12	.52	-.06	.31	.17	.26	.12	.07	.69
39	Total Score (E)	.10	.13	.48	-.07	.32	.06	.10	.72	.22	.07	.17	.98
40	Total Score (K)	.02	.07	.61	.09	.42	.10	.59	.03	.12	.07	.08	.95
41	Stress Score (E)	.30	-.04	.22	-.07	.47	.46	.06	.61	.08	.02	.16	.99
42	Stress Score (K)	.10	-.09	.30	.03	.60	.00	.65	.11	.09	.12	.00	.93
43	Masculinity Score (E)	-.05	.21	.49	.10	.31	-.08	.13	.52	.19	.27	.37	.93
44	Masculinity Score (K)	-.02	.08	.82	.09	.33	.11	.29	-.04	.10	.12	.08	.93
45	Masculinity Estimation - Grant Study	-.04	.21	-.11	.68	-.13	.06	.10	-.07	-.11	.02	-.12	.58
46	Masculine Component - Physical Examination	.11	.02	.16	.53	.00	-.18	.00	-.04	.19	-.09	.21	.44
47	Age in Months	-.06	.49	-.21	.06	.28	-.09	.00	.17	.16	-.05	.09	.44

* h^2 = Communality.

Summary of Factor Analysis for Personal Interview Data

In the discussion which follows, a loading of ±0.20 or higher is considered to be statistically significant. The factors isolated by this analysis, as shown by the factor loadings in Table D-8, are as follows.

Factor 1 has high positive loadings on the family history rating of both interviewers (0.60 for each of variables 07 and 08); this is the only item common to both interviewers for this factor and it is accordingly labeled family history. The loading of 0.30 for interviewer E's stress score suggests that he takes an individual's family history into consideration in estimating adjustment to stressful situations. The almost complete lack of projections on the other interview items is evidence that the evaluation of family history was influenced little by other information obtained and judgments made.

Factor 2 has significant positive loadings on both interviewers' ratings of psychological and social maturity and for emancipation from home. The factor has been designated maturity; logically enough, it has a positive loading on the age in months variable. The loading of 0.51 for interviewer K's rating of use of tobacco and alcohol implies that such use was judged to be a fairly high indication of maturity by this examiner; interviewer E failed to agree. The latter regards the concept of maturity as a partial determiner of masculinity score (0.21 on variable 43). The loading of 0.21 on the estimate of masculinity derived from the area study on body types (variable 45) suggests that judgments of an individual's psychological and social maturity were influenced by certain physical signs of masculine maturity.

Factor 5 has significant positive loadings for both interviewers' ratings of attitude toward rough sports, emotional stability, lack of tension or anxiety, absence of signs of physical fear, lack of apprehension and leadership. The pattern appears indicative of the general appraisal of an individual as "normal" rather than "neurotic" and hence the factor is labeled personality adjustment. It has a significant loading on the three summary scores of both interviewers.

Both interviewers had additional items which they deemed important in gauging this factor of personality adjustment. For interviewer E, these were use of tobacco and alcohol and lack of depression, and for interviewer K, they were appearance and manner, record of illness, emancipation from home, interest in hobbies, participation in athletics, and a lack of anxiety symptoms.

Factor 3 is the component most common to all ratings made. For both interviewer estimates, it appears significantly on 10 of the 11 items contributing to the masculinity scores, and is identified as masculinity-interview estimate. Although the variables, lack of evidence of depression and absence of physical fear, are not items specified for tabulating masculinity score, apparently they are taken into consideration by both interviewers in judging an individual's masculinity. This is indicated by the loadings of 0.22 and 0.39 for variables 27 and 28, and the loadings of 0.31 and 0.39 for variables 37 and 38.

Apparently also, an interviewer's judgment of an individual's masculinity influences his estimate of that person's ability to adjust successfully to stress situations, as evidence the loadings of 0.22 and 0.30 for variables 41 and 42.

Factor 4 has its two highest loadings on the objective measures of masculinity obtained from other area studies, 0.68 for the body type estimate (variable 45), and 0.53 for the physical examination estimate (variable 46), and accordingly it has been designated physical index of masculinity.

Only one interview rating had significant loadings for both interviewers on this factor - evidence of apprehension (in this case, lack of apprehension) had loadings of 0.34 and 0.20 for variables 31 and 32. Interviewer E's rating of physical fear had a loading of -0.23 for this factor, indicating that his estimate of an individual's concern about physical injury and reaction to close calls was not influenced by the physical appearance of the person. Interviewer K's rating of assuredness had a loading of 0.20 on this factor, suggesting that his appraisal of this trait was influenced by physical appearance. The factor, then, is regarded as the objective estimate of masculinity contrasted to the subjective type obtained in an interview.

Factor 6 is concerned with the ratings given by interviewer E to a variety of items; it has significant positive loadings for apprehension, tension, illness, indications of physical fear and stress score. Similarly, factor 7 is concerned with the ratings given by interviewer K for a large number of items: appearance and manner, assuredness, motivation and ambition, family history, emancipation from home, use of tobacco and alcohol, leadership, participation in athletics, depression, emotionality, apprehension, tension, anxiety symptoms and signs of physical fear. These two factors are considered to indicate each interviewer's particular bias for estimating the ability of an individual to adjust to stressful situations. The recurrence of such items as

apprehension, tension and signs of physical fear shows that the two examiners agree on these as evidences of stress. However, the orthogonality of the factors indicates that the interviewers cannot agree upon such evidence. The factors are labeled stress estimates, interviewer E (factor 6) and interviewer K (factor 7). The specificity of approach shown by these factors is taken as indication of the lack of objectivity of an interview estimate of stress tolerance.

Factor 8 has only one item - assuredness - common to both interviewers (loading of 0.51 for variable 03, and 0.38 for variable 04), Accordingly it is called assurance. Interviewer K had no other significant loadings on this factor, but it influenced all three summary scores of interviewer E as well as his estimate of apprehension, motivation, maturity, leadership, depression, school and job activities, appearance and manner, emancipation from home, concomitants of anxiety, interest in and participation in athletics. This mixture of items from so many fields implies evidence of a "halo effect" in the ratings given by interviewer E, based upon an over-evaluation of the role of his estimate of assurance. The factor lends credence to the contention of this examiner that he judges a man as he enters the door!

Factor 10 is not too well developed. It has loadings on interviewer E's ratings of motivation, appearance and manner, masculinity and participation in athletics, and on interviewer K's estimates of emancipation from home, attitude toward rough sports, and emotionality. It is tentatively identified as self-reliance. The examiners do not agree on what constitutes evidence of this factor, and only interviewer E thought it of value for his summary score.

Factor 11 is confined to interviewer E's ratings of emotionality, participation in athletics, attitude toward rough sports and leadership. This factor has significant projections on his estimate of the masculinity score and on the masculinity component from the physical examination study (variable 46). The factor appears to be a specific masculinity estimate of interviewer E due to influence by physical signs of masculinity. The high loading (0.80 on variable 29) was used to label the factor as stability-interviewer E specific.

Loadings on factor 9 are primarily for the ratings of interviewer E. Significant positive loadings appear on his estimates of illness, appearance and manner, school and job activities, family history, attitude toward rough sports, interest in hobbies, smoking and use of alcohol, participation in athletics, leadership and total score. The lone loading for examiner K was for physical fear. The factor is tentatively

identified as health-interviewer E specific. It would appear that examiner K may have mistaken illness for fright; at any rate, he considered the factor of little or no importance.

APPENDIX E

Rorschach Test Studies

Figure E-1	Sample of Rorschach Tabulation Sheet Utilized by Scorer (K)
Figure E-2	Sample of Rorschach Inspection Record Utilized by Scorer (K)
Table E-1	Summary of Variables for Rorschach (K) Study With Their Means and Standard Deviations
Table E-2	Intercorrelations and Residuals of Variables from Rorschach (K) Study
Table E-3	Unrotated Factor Loadings of Rorschach (K) Study
Figure E-3	Sample of Rorschach Tabulation Sheet Utilized by Scorer (S)
Figure E-4	Sample of Rorschach Stress Check List Utilized by Scorer (S)
Table E-4	Summary of Rorschach (S) Data
Table E-5	Summary of Variables for Rorschach (S) Study With Their Means and Standard Deviations
Table E-6	Intercorrelations and Residuals of Variables from Rorschach (S) Study
Table E-7	Unrotated Factor Loadings of Rorschach (S) Study

Figure E-1

Sample of Rorschach Tabulation Sheet Utilized by Scorer (K)

R				M			H	
W				FM			Hd	
	WS			m			A	
	DW			k			Ad	
D				K			Aobj	
	DS			FK			At.	
d				F			W	
				F (c)			Geo	
S				(c)			Arch	
				C'			Pl.	
				FC			Obj.	
				CF				
				C				

R =	No. of 0 =	W%
T =	(H + A) : (Hd + Ad) =	D%
T/R =	FC + 2CF + 3c/2 =	d%
F/R = F%	M/c =	S%
F + % =	(FM + m) : (Fc + c + C') =	
FK + F + F(c)/R =	R-8-9-10/T-R =	
A + Ad/R = A%	W : M =	
No. of P =	Succession:	

Name: ______________________________

Date: ______________________________

Number: ______________________________

Figure E-2

Sample of Rorschach Inspection Record Utilized by Scorer (K)

Name ______ Date of test ______ Adjustment rating ______

Sex ______ Age ______ Occupation ______

Check List			Personality Description
	Number of R		
	T/R> 60" <30" (+, -)		
	Refusal (√)		
Location	W (+, -, V, B)		
	Dd (+)		
	S (+)		
	Suc (r, l)		
Content	P, Com (-)		
	0 (+, B)		
	At, Sex (+)		
	Range (+, -)		
Form	F% (+, -)		
	F (V. B. E)		
Shading	Shading Shock (±) (√)		
	FK, Fc (+, -)		
	c (+)		
	C' (+)		
	K, k (+)		
Movement	M (+, -, B, r, d)		
	FM, FM:M (+, -)		
	m (+)		
	Total Movement (+, -)		
Color	Color Shock (±) (√)		Qualitative Observations on Performance
	FC (-, B)		
	CF, CF:FC (+, -)		
	C> 1, Cn (+)		
	Total Color (+, -)		
	Color: Movement (+, -)		
	Total Number of Checks		

Table E-1

Summary of Variables for Rorschach (K) Study With Their Means and Standard Deviations
Population = 119

Variable No.	Description of Variable	Mean	Standard Deviation
01	Total No. of Responses	22.487	± 9.365
02	Total No. of Checks	11.025	± 4.634
03	Total Stress Score	4.025	± 1.780
04	Location	1.269	± 1.275
05	Content	1.017	± 1.037
06	Form	0.773	± 0.804
07	Shading	1.067	± 1.128
08	Movement	2.462	± 1.823
09	Color	2.849	± 2.089
10	Stress Values	3.908	± 1.782
11	M + FM + m (A)	1.874	± 1.688
12	M + FM + m (A_1 stress)	0.462	± 0.531
13	M + FM (B)	1.765	± 1.694
14	M + FM (B_1 stress)	0.353	± 0.478
15	FM + m (C)	1.076	± 1.101
16	FM + m (C_1 stress)	0.118	± 0.322
17	k + K (D)	0.084	± 0.306
18	k + K (D_1 stress)	0.084	± 0.306
19	Fc + c (E)	0.672	± 0.757
20	Fc + c (E_1 stress)	0.151	± 0.381
21	Fc + c + C′ (F_1 stress)	0.193	± 0.416
22	FC + CF + C (H)	1.218	± 1.182
23	CF + C (I)	0.588	± 0.715
24	Sum C	24.160	±23.512
25	Color Movement (+, -)	1.429	± 1.149
26	Refusal (√)	0.202	± 0.478

Table E-2

Intercorrelations and Residuals of Variables from Rorsch

Population = 119; Significance Levels: P = 0.05, $|r| \geq 0.19$; P

Residuals

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
01		.12	.04	.06	.10	.04	-.12	.03	-.03	-.18	-.02	.06	.00	.12	-.09	-.07
02	-.05		-.18	.01	.00	.04	-.03	.05	-.05	-.04	-.03	.02	-.03	.02	.00	.10
03	-.02	.66		-.05	-.06	-.07	-.02	-.01	.04	.15	.01	-.03	.00	-.12	.08	.10
04	.49	.42	.30		.02	-.02	.07	-.02	-.04	.17	.00	-.06	.00	-.11	.03	-.08
05	.12	.49	.36	.31		-.02	-.02	.04	-.04	.05	-.02	-.02	-.03	-.04	.04	.08
06	.24	.50	.38	.31	.28		.04	.02	.05	.10	-.03	-.04	-.01	-.06	-.08	-.06
07	-.22	.39	.54	.08	.09	.17		.00	-.03	-.07	.00	.01	.01	.06	-.01	.06
08	-.10	.48	.17	.04	.23	.18	.01		-.03	-.05	.00	.03	.01	.02	.00	.07
09	-.27	.64	.44	.00	.06	.21	.17	-.05		.02	.01	-.02	.02	-.01	-.02	-.05
10	-.07	.67	.98	.31	.36	.40	.54	.15	.47		.01	.03	.03	.08	.00	.00
11	-.02	.47	.29	.12	.24	.23	.06	.91	-.02	.28		-.01	.00	-.01	-.01	.03
12	.01	.34	.42	.10	.14	.19	.09	.66	-.03	.35	.71		-.03	-.02	-.01	.23
13	-.06	.48	.28	.12	.24	.25	.06	.88	.00	.30	.98	.63		-.01	.01	-.11
14	-.16	.40	.41	.13	.18	.27	.10	.64	.06	.44	.74	.81	.77		.01	-.23
15	.03	.39	.20	.05	.21	.06	.07	.86	-.08	.17	.91	.62	.87	.54		.13
16	.24	-.05	.08	-.06	-.03	-.09	.00	.12	-.15	-.08	.06	.47	-.12	-.11	.21	
17	.31	.18	.23	.14	.02	.11	.28	.11	-.01	.17	.10	.12	.04	-.09	.21	.33
18	.35	.11	.20	.16	.02	.08	.23	.11	-.10	.14	.10	.12	.04	-.09	.21	.33
19	-.31	.40	.42	.06	.18	.17	.85	.05	.20	.46	.10	.04	.14	.18	.05	-.19
20	-.07	-.01	.14	.04	-.01	.00	.41	-.08	-.06	.16	-.01	.03	.00	.08	-.05	-.01
21	-.05	-.04	.10	.06	-.03	-.05	.40	-.06	-.12	.12	-.05	-.02	-.03	.04	-.07	-.04
22	-.18	.61	.39	.10	.09	.22	.21	-.07	.90	.42	-.02	-.05	.00	.03	-.05	-.16
23	-.08	.46	.27	.14	.12	.22	.22	.02	.58	.29	.08	.01	.09	.08	.07	-.12
24	.17	-.17	.03	.08	.07	.09	.10	-.07	-.25	.01	-.06	.02	-.08	-.03	-.08	.08
25	-.01	.38	.00	.01	.01	-.13	-.12	.05	.40	-.01	-.07	-.09	-.10	-.18	.03	.09
26	-.39	.15	.27	-.17	-.09	.01	.24	.02	.15	.30	.01	.03	.04	.13	-.06	-.15

Table E-2

lations and Residuals of Variables from Rorschach (K) Study
9; Significance Levels: P = 0.05, |r| ≥ 0.19; P = 0.01, |r| ≥ 0.25

Residuals

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
.03	-.18	-.02	.06	.00	.12	-.09	.07	.04	.03	-.08	.00	-.02	-.04	-.03	.04	.00	-.02
.05	-.04	-.03	.02	-.03	.02	.00	.10	-.04	-.03	-.04	.06	.01	-.06	-.03	.06	-.03	-.07
.04	.15	.01	-.03	.00	-.12	.08	.10	-.05	-.04	-.08	.00	.04	.05	.04	.00	-.04	-.06
.04	.17	.00	-.06	.00	-.11	.03	-.08	.03	.05	.06	-.02	.00	.01	.01	-.02	.01	.04
.04	.05	-.02	-.02	-.03	-.04	.04	.08	-.04	-.05	.04	-.04	-.03	-.02	.02	.02	.04	.07
.05	.10	-.03	-.04	-.01	-.06	-.08	-.06	.04	.01	.05	.03	.01	.00	-.03	-.02	.05	-.03
.03	-.07	.00	.01	.01	.06	-.01	.06	-.03	-.02	-.04	.14	-.09	.00	.02	.00	-.03	-.06
.03	-.05	.00	.03	.01	.02	.00	.07	-.04	-.03	.00	-.02	.02	-.04	-.02	.05	-.03	-.01
	.02	.01	-.02	.02	-.01	-.02	-.05	.03	.02	.00	.00	-.01	.04	-.03	.02	.00	.00
.47		.01	.03	.03	.06	.00	.00	-.01	.02	-.09	.03	.02	.02	-.01	.02	-.01	-.07
.02	.28		-.01	.00	-.01	-.01	.03	-.01	-.01	.01	.01	-.01	.02	.01	-.01	.00	.02
.03	.35	.71		-.03	-.02	-.01	.23	-.11	-.12	.03	-.02	-.01	.00	.00	.00	.00	.03
.00	.30	.98	.63		-.01	.01	-.11	.05	.05	-.02	.00	-.02	.02	.01	-.02	.02	.02
.06	.44	.74	.81	.77		.01	-.23	.13	.11	.06	-.01	-.01	-.01	.01	-.03	.01	.04
.08	.17	.91	.62	.87	.54		.13	-.07	-.06	.00	.01	-.03	.00	.01	-.01	-.01	.03
.15	-.08	.06	.47	-.12	-.11	.21		.06	.04	.01	-.03	-.04	-.07	-.07	.05	-.07	.09
.01	.17	.10	.12	.04	-.09	.21	.33		-.02	-.02	.01	.02	.02	.02	-.04	.02	-.04
.10	.14	.10	.12	.04	-.09	.21	.33	.91		.00	.02	.04	.02	.01	-.03	.02	-.05
.20	.46	.10	.04	.14	.18	.05	-.19	-.03	-.06		.16	-.14	.02	.00	.03	-.02	-.02
.06	.16	-.01	.03	.00	.08	-.05	-.01	-.04	-.04	.35		-.02	-.01	-.01	-.03	.04	.08
.12	.12	-.05	-.02	-.03	.04	-.07	-.04	-.06	-.06	.26	.88		.00	.00	-.01	.00	.05
.90	.42	-.02	-.05	.00	.03	-.05	-.16	.00	-.07	.21	-.04	-.09		.05	-.04	-.01	.01
.58	.29	.08	.01	.09	.08	.07	-.12	.04	.01	.15	.07	.04	.80		.00	.01	.01
.25	.01	-.06	.02	-.08	-.03	-.08	.08	.03	.08	.05	.13	.12	-.21	-.02		.00	.04
.40	-.01	-.07	-.09	-.10	-.18	.03	.09	.07	.02	-.14	-.21	-.12	.33	.12	-.37		-.05
.15	.30	.01	.03	.04	.13	-.06	-.15	-.12	-.12	.25	-.17	-.15	.06	-.05	-.13	-.08	

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Table E-3

Unrotated Factor Loadings of Rorschach (K) Study
Population = 119

Variable No.	Description of Variable	Orthogonal Factors									h^{2}*
		1	2	3	4	5	6	7	8	9	
01	Total No. of Responses	.34	-.42	-.24	.34	.35	-.32	.20	.05	.55	1.04
02	Total No. of Checks	.91	.01	.18	-.16	.00	.51	-.12	-.30	.04	1.25
03	Total Stress Score	.88	.17	-.05	-.16	.14	.02	.39	-.13	.26	1.09
04	Location	.53	-.13	-.11	.19	.04	-.08	-.02	-.06	-.32	0.46
05	Content	.54	-.09	.05	.05	-.06	-.06	-.10	-.05	.05	0.33
06	Form	.57	-.06	.02	-.03	-.02	-.02	.03	.14	-.14	0.37
07	Shading	.38	.92	-.01	-.20	.20	.05	-.06	-.01	.13	1.09
08	Movement	.26	-.11	.87	-.01	.08	.05	-.02	-.05	.02	0.85
09	Color	.32	.02	-.15	-.21	-.14	.30	.16	-.01	.12	0.87
10	Stress Values	.65	.29	.05	-.20	.04	.17	.23	-.02	.34	0.75
11	M + FM + m (A)	.38	-.09	.92	.02	.03	-.02	.02	.01	.01	1.00
12	M + FM + m (A_1 stress)	.34	-.06	.61	.02	.25	-.07	.48	.01	-.09	0.80
13	M + FM (B)	.40	-.07	.89	.02	-.12	-.02	.02	.03	-.02	0.97
14	M + FM (B_1 stress)	.45	-.01	.63	-.01	-.21	-.11	.66	.01	-.25	1.15
15	FM + m (C)	.21	-.05	.90	.01	.21	.07	-.11	.01	.01	0.92
16	FM + m (C_1 stress)	-.11	-.05	.06	.09	.37	-.01	.27	.04	-.18	0.27
17	k + K (D)	.19	.02	.02	-.02	.95	.05	-.14	.00	.10	0.97
18	k + K (D_1 stress)	.17	-.01	.03	.01	.93	-.04	-.12	.04	.06	0.92
19	Fc + c (E)	.38	.77	.03	-.24	-.14	.00	-.08	-.07	.15	0.85
20	Fc + c (E_1 stress)	.08	.41	-.02	.72	-.07	.00	.17	.04	.21	0.77
21	Fc + c + C' (F_1 stress	.04	.71	.01	.79	-.10	.00	.04	-.14	.03	1.16
22	FC + CF + C (H)	.36	.04	-.17	-.14	-.13	.83	.06	.22	-.02	0.94
23	CF + C (I)	.34	.08	-.05	.04	-.06	.64	-.02	.44	-.06	0.74
24	Sum C	.11	.09	-.11	.15	.08	-.35	-.02	.37	-.01	0.32
25	Color Movement (+, -)	-.05	-.20	-.05	-.03	.09	.55	.07	.43	.07	0.55
26	Refusal (√)	.02	.14	.03	.32	.16	.00	-.22	.10	-.17	0.24

* h^2 = Communalities; underlined communality values need final adjustment to reduce them to 1.00 or less.

Figure E-3

Sample of Rorschach Tabulation Sheet Utilized by Scorer (S)

M	FM	m	k	K	FK	F	Fc	c	C'	FC	CF	C

Content	
H	
Hd	
A	
Ad	
Aobj	
At, Sex	
Obj	
Pl	
N	
Geo	
Art	
Other:	

Total responses (R):

$\frac{\text{Total F}}{R}$: F%

$\frac{FK + F + Fc}{R}$: %

$\frac{A + Ad}{R}$: A%

Number of P:

Number of 0:

(H + A) (Hd + Ad): :

Sum C = $\frac{(FC + 2CF + 3C)}{2}$:

M:sum C =

(FM + m) (Fc + c + C') = :

$\frac{\text{No. R to VIII, IX, X}}{R}$: %

W:M = :

No. ___ W ___ D ___ d ___ Dd, S

W(%) D(%) d(%) S(%)

Name: ______________________________

Date: ______________________________

Number: ______________________________

Figure E-4

Sample of Rorschach Stress Check List Utilized by Scorer (S)

1.	Refusal	√ √	
2.	Dd increase	√	over 10%
3.	F%	√	under 20%; over 60%
4.	Absence FK, Fc	√	not scored if there are two or more additionals
5.	K, k	√	R under 15: 1 or 2 R 15-50 : 2 or 3 R above 50: 3 or 4
6.	m	√	tension m, main or additional
7.	Absence M	√ √	no M: √ √ 1 M or only 2 additional: √
8.	Absence FC	√ √	no FC: √ √ 1 FC or only 2 additional: √
9.	Negative color balance	√	FC - (CF + C) is negative
10.	Color shock	√ √	Severe: √ √ Mild or with recovery: √
11.	Shading shock	√ √	Severe: √ √ Mild or with recovery: √ Sex shock alone: √

TOTAL: 16 max.

Name: ______________________

Date: ______________________

Number: ______________________

[redacted]

Table E-4

Summary of Rorschach (S) Data

Group No.	Subject No.	Total No. of Responses	Stress Score Total	M%	FM%	m%	k%	K%	FK%	F%	Fc%	c%	C'%	FC%	CF%	C%	W%	D%	d%	rd%
01	1*	18	5	11.2	16.8	11.2	0.0	5.6	0.0	39.2	0.0	5.6	0.0	5.6	5.6	0.0	62.0	34.0	0.0	5.0
01	2*	35	-3	2.9	8.7	2.9	2.9	2.9	2.9	60.9	5.8	0.0	2.9	5.8	0.0	0.0	17.0	68.0	12.0	3.0
01	3*	23	4	8.6	17.2	8.6	0.0	4.3	0.0	43.0	0.0	8.6	0.0	8.6	0.0	0.0	17.0	66.0	4.0	13.0
01	4*	39	3	0.0	13.0	0.0	0.0	0.0	0.0	67.6	5.2	0.0	2.6	13.0	0.0	0.0	10.0	55.0	13.0	23.0
01	5*	10	7	10.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	30.0	10.0	0.0	20.0	70.0	0.0	10.0
01	6*	18	5	5.6	11.2	0.0	0.0	0.0	0.0	61.6	11.2	0.0	0.0	5.6	5.6	0.0	45.0	45.0	0.0	11.0
02	1	20	9	5.0	10.0	0.0	0.0	0.0	0.0	60.0	0.0	0.0	0.0	5.0	20.0	0.0	45.0	55.0	0.0	0.0
02	2	14	7	21.3	0.0	0.0	0.0	0.0	0.0	63.9	0.0	7.1	0.0	7.1	0.0	0.0	36.0	64.0	0.0	0.0
02	3	17	3	5.9	35.4	0.0	0.0	0.0	0.0	41.3	11.8	0.0	0.0	5.9	0.0	0.0	30.0	52.0	12.0	6.0
02	4	15	2	13.4	53.6	0.0	0.0	0.0	0.0	6.7	0.0	6.7	0.0	13.4	6.7	0.0	53.0	47.0	0.0	0.0
02	5*	19	3	15.9	10.6	0.0	0.0	0.0	5.3	37.1	0.0	0.0	0.0	10.6	21.2	0.0	37.0	48.0	5.0	10.0
02	6	18	2	16.8	33.6	0.0	0.0	0.0	5.6	11.2	11.2	0.0	0.0	16.8	5.6	0.0	34.0	56.0	0.0	11.0
03	1	20	5	10.0	15.0	0.0	0.0	0.0	5.0	55.0	10.0	0.0	0.0	0.0	0.0	5.0	60.0	35.0	5.0	0.0
03	2	15	5	6.7	26.8	0.0	0.0	0.0	6.7	46.9	13.4	0.0	0.0	0.0	0.0	0.0	40.0	60.0	0.0	0.0
03	3	19	8	10.6	15.9	5.3	0.0	0.0	0.0	58.3	5.3	0.0	0.0	5.3	0.0	0.0	21.0	53.0	5.0	21.0
03	4	38	8	5.2	15.6	2.6	2.6	2.6	7.8	54.6	0.0	0.0	0.0	0.0	7.8	0.0	10.0	51.0	16.0	23.0
03	5	24	1	12.6	4.2	12.6	0.0	0.0	0.0	54.6	4.2	0.0	4.2	8.4	0.0	0.0	21.0	71.0	0.0	8.0
03	6	19	1	21.2	10.6	10.6	0.0	0.0	0.0	15.9	5.3	0.0	10.6	21.2	5.3	0.0	74.0	16.0	5.0	5.0
04	1	35	9	8.7	11.6	0.0	0.0	5.8	0.0	63.8	2.9	0.0	2.9	0.0	5.8	0.0	15.0	70.0	6.0	9.0
04	2	25	3	16.0	24.0	4.0	0.0	0.0	12.0	16.0	4.0	8.0	0.0	8.0	8.0	0.0	44.0	36.0	0.0	20.0
04	3	25	0	12.0	20.0	0.0	0.0	0.0	0.0	40.0	4.0	0.0	0.0	20.0	4.0	0.0	20.0	72.0	4.0	4.0
04	4*	13	5	15.4	30.8	0.0	0.0	0.0	0.0	38.5	0.0	0.0	0.0	15.4	0.0	0.0	39.0	54.0	8.0	0.0
04	5	18	2	5.6	33.6	0.0	0.0	0.0	0.0	44.8	5.6	5.6	0.0	5.6	0.0	0.0	17.0	72.0	11.0	0.0
04	6	52	2	14.0	16.0	0.0	0.0	0.0	4.0	56.0	6.0	2.0	0.0	6.0	0.0	0.0	10.0	58.0	12.0	24.0
05	1	13	5	23.1	23.1	7.7	0.0	0.0	7.7	23.1	15.4	0.0	0.0	0.0	0.0	0.0	31.0	62.0	0.0	8.0
05	2*	11	8	18.2	18.2	0.0	0.0	0.0	0.0	45.5	9.1	0.0	0.0	0.0	9.1	0.0	55.0	36.0	9.0	0.0
05	3*	22	2	9.0	27.0	0.0	0.0	0.0	9.0	49.5	0.0	0.0	0.0	4.5	0.0	0.0	18.0	59.0	14.0	9.0
05	4	14	9	0.0	21.3	0.0	0.0	0.0	0.0	42.6	7.1	7.1	0.0	7.1	7.1	7.1	36.0	50.0	0.0	14.0
05	5	18	5	5.6	22.4	11.2	0.0	0.0	0.0	33.6	11.2	0.0	0.0	5.6	11.2	0.0	62.0	39.0	0.0	0.0
05	6	11	4	18.2	18.2	0.0	0.0	0.0	0.0	36.4	9.1	0.0	0.0	9.1	9.1	0.0	91.0	9.0	0.0	0.0
06	1	12	6	0.0	0.0	0.0	0.0	0.0	0.0	66.4	0.0	0.0	0.0	16.6	16.6	0.0	58.0	42.0	0.0	0.0
06	2	24	4	4.2	12.6	0.0	8.4	0.0	0.0	58.8	0.0	4.2	4.2	8.4	0.0	0.0	29.0	67.0	0.0	4.0
06	3	25	4	4.0	20.0	0.0	0.0	4.0	20.0	32.0	4.0	4.0	0.0	4.0	8.0	0.0	32.0	60.0	4.0	4.0
06	4	24	5	0.0	4.2	4.2	0.0	4.2	0.0	63.0	8.4	0.0	0.0	16.8	0.0	0.0	29.0	50.0	13.0	8.0
06	5	18	4	5.6	5.6	0.0	0.0	0.0	0.0	61.6	5.6	5.6	0.0	16.8	0.0	0.0	28.0	50.0	0.0	22.0
06	6	26	6	15.2	19.0	0.0	3.8	0.0	11.4	30.4	0.0	3.8	0.0	7.6	7.6	0.0	50.0	34.0	0.0	15.0
07	1*	21	5	14.4	14.4	0.0	4.8	0.0	4.8	38.4	0.0	14.4	9.6	0.0	0.0	0.0	71.0	24.0	0.0	5.0
07	2*	12	6	8.3	24.9	0.0	0.0	8.3	0.0	33.2	8.3	8.3	0.0	8.3	0.0	0.0	33.0	50.0	0.0	17.0
07	3	21	5	14.4	19.2	0.0	0.0	0.0	14.4	9.6	9.6	9.6	0.0	4.8	19.2	0.0	57.0	43.0	0.0	0.0
07	4*	33	4	6.0	12.0	0.0	0.0	0.0	3.0	54.0	3.0	3.0	0.0	6.0	9.0	3.0	27.0	54.0	6.0	12.0
07	5	23	6	4.3	25.8	0.0	0.0	0.0	0.0	60.2	0.0	4.3	0.0	0.0	4.3	0.0	26.0	66.0	4.0	4.0
07	6	11	8	9.0	27.0	0.0	0.0	0.0	9.0	27.0	0.0	0.0	0.0	0.0	27.0	0.0	63.0	18.0	18.0	0.0
08	1	26	8	11.4	7.6	0.0	0.0	0.0	7.6	65.0	0.0	3.8	0.0	0.0	3.8	0.0	19.0	54.0	8.0	19.0
08	2	28	6	7.4	3.7	0.0	0.0	0.0	0.0	77.7	3.7	7.4	0.0	0.0	3.7	0.0	33.0	52.0	15.0	0.0
08	3	33	9	3.0	9.0	0.0	3.0	6.0	3.0	21.0	3.0	15.0	6.0	0.0	24.0	6.0	90.0	9.0	0.0	0.0
08	4	20	3	15.0	25.0	5.0	0.0	0.0	0.0	35.0	0.0	5.0	0.0	10.0	5.0	0.0	35.0	45.0	10.0	10.0
08	5*	42	5	2.4	19.2	0.0	0.0	2.4	9.6	52.8	7.2	2.4	0.0	2.4	2.4	0.0	17.0	31.0	19.0	24.0
08	6*	57	8	0.0	7.2	0.0	0.0	1.8	0.0	79.2	5.4	0.0	0.0	7.2	1.8	0.0	4.0	40.0	29.0	27.0
09	1*	29	5	23.8	20.4	3.4	3.4	0.0	0.0	44.2	3.4	0.0	0.0	0.0	0.0	0.0	27.0	50.0	3.0	20.0
09	[illegible]	21	1	19.2	28.8	0.0	0.0	0.0	4.8	33.6	0.0	4.8	0.0	9.6	0.0	0.0	48.0	48.0	0.0	4.0
09	3*	47	9	4.2	6.3	6.3	0.0	0.0	0.0	79.8	0.0	0.0	0.0	0.0	2.1	0.0	4.0	62.0	17.0	17.0
09	4*	30	6	9.9	16.5	3.3	6.6	3.3	0.0	36.3	0.0	3.3	0.0	9.9	3.3	6.6	40.0	44.0	13.0	3.0
09	5	22	3	4.5	9.0	0.0	0.0	0.0	4.5	36.0	13.5	4.5	4.5	9.0	13.5	0.0	41.0	41.0	18.0	0.0
09	6*	9	10	0.0	44.0	0.0	0.0	0.0	0.0	33.0	11.0	0.0	0.0	0.0	11.0	0.0	77.0	11.0	0.0	11.0
10	1	20	1	25.0	10.0	0.0	0.0	5.0	5.0	35.0	5.0	5.0	0.0	10.0	0.0	0.0	35.0	60.0	5.0	0.0
10	2	14	9	0.0	14.2	7.1	0.0	0.0	7.1	42.6	14.2	0.0	0.0	0.0	0.0	14.2	29.0	64.0	0.0	7.0
10	3	27	1	14.8	14.8	0.0	0.0	0.0	3.7	51.8	7.4	0.0	0.0	7.4	0.0	0.0	11.0	60.0	22.0	7.0
10	4	23	4	4.3	8.6	0.0	0.0	0.0	4.3	73.1	0.0	4.3	0.0	4.3	0.0	0.0	17.0	62.0	17.0	4.0
10	5	20	6	10.0	15.0	0.0	5.0	0.0	10.0	30.0	10.0	5.0	0.0	0.0	15.0	0.0	45.0	20.0	30.0	5.0
10	6	23	4	8.6	21.5	8.6	0.0	0.0	4.3	25.8	8.6	0.0	0.0	8.6	12.9	0.0	30.0	47.0	17.0	4.0
11	1	20	3	15.0	25.0	0.0	0.0	0.0	0.0	40.0	0.0	10.0	0.0	5.0	5.0	0.0	35.0	55.0	10.0	0.0
11	2	42	2	16.8	16.8	4.8	0.0	0.0	0.0	48.0	4.8	0.0	0.0	7.2	2.4	0.0	31.0	42.0	5.0	22.0
11	3	11	8	36.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	9.0	18.0	0.0	9.0	0.0	90.0	9.0	0.0	0.0
11	4*	15	8	0.0	13.4	6.7	0.0	0.0	6.7	60.3	0.0	6.7	0.0	6.7	0.0	0.0	27.0	67.0	0.0	6.0
11	5	15	11	0.0	6.7	0.0	0.0	0.0	0.0	0.0	26.8	33.5	13.4	0.0	20.1	0.0	73.0	27.0	0.0	0.0
11	6	49	5	16.0	6.0	4.0	0.0	4.0	0.0	50.0	4.0	0.0	2.0	6.0	6.0	0.0	8.0	56.0	6.0	28.0
12	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]														

08	6*	57	8	0.0	7.2	0.0	0.0	1.8	0.0	79.2	5.4	0.0	0.0	7.2	1.8	0.0	4.0	40.0	29.0	27.0
09	1*	29	5	23.8	20.4	3.4	3.4	0.0	0.0	44.2	3.4	0.0	0.0	0.0	0.0	0.0	27.0	50.0	3.0	20.0
09	2	21	1	19.2	28.8	0.0	0.0	0.0	4.8	33.6	0.0	4.8	0.0	9.6	0.0	0.0	48.0	48.0	0.0	4.0
09	3*	47	9	4.2	6.3	6.3	0.0	0.0	0.0	79.8	0.0	0.0	0.0	0.0	2.1	0.0	4.0	62.0	17.0	17.0
09	4*	30	6	9.9	16.5	3.3	6.6	3.3	0.0	36.3	0.0	3.3	0.0	9.9	3.3	6.6	40.0	44.0	13.0	3.0
09	5	22	3	4.5	9.0	0.0	0.0	0.0	4.5	36.0	13.5	4.5	4.5	9.0	13.5	0.0	41.0	41.0	18.0	0.0
09	6*	9	10	0.0	44.0	0.0	0.0	0.0	0.0	33.0	11.0	0.0	0.0	0.0	11.0	0.0	77.0	11.0	0.0	11.0
10	1	20	1	25.0	10.0	0.0	0.0	5.0	5.0	35.0	5.0	5.0	0.0	10.0	0.0	0.0	35.0	60.0	5.0	0.0
10	2	14	9	0.0	14.2	7.1	0.0	0.0	7.1	42.6	14.2	0.0	0.0	0.0	0.0	14.2	29.0	64.0	0.0	7.0
10	3	27	1	14.8	14.8	0.0	0.0	0.0	3.7	51.8	7.4	0.0	0.0	7.4	0.0	0.0	11.0	60.0	22.0	7.0
10	4	23	4	4.3	8.6	0.0	0.0	0.0	4.3	73.1	0.0	4.3	0.0	4.3	0.0	0.0	17.0	62.0	17.0	4.0
[illegible]	5	20	6	10.0	15.0	0.0	5.0	0.0	10.0	30.0	10.0	5.0	0.0	0.0	15.0	0.0	45.0	20.0	30.0	5.0
[illegible]	6	23	4	8.6	21.5	8.6	0.0	0.0	4.3	25.8	8.6	0.0	0.0	8.6	12.9	0.0	30.0	47.0	17.0	4.0
[illegible]	1	20	3	15.0	25.0	0.0	0.0	0.0	0.0	40.0	0.0	10.0	0.0	5.0	5.0	0.0	35.0	55.0	10.0	0.0
[illegible]	2	42	2	16.8	16.8	4.8	0.0	0.0	0.0	48.0	4.8	0.0	0.0	7.2	2.4	0.0	31.0	42.0	5.0	22.0
[illegible]	3	11	8	36.0	0.0	0.0	0.0	0.0	0.0	27.0	0.0	9.0	18.	0.0	9.0	0.0	90.0	9.0	0.0	0.0
[illegible]	4*	15	8	0.0	13.4	6.7	0.0	0.0	6.7	60.3	0.0	6.7	0.0	6.7	0.0	0.0	27.0	67.0	0.0	6.0
[illegible]	5	15	11	0.0	6.7	0.0	0.0	0.0	0.0	0.0	26.8	33.5	13.4	0.0	20.1	0.0	73.0	27.0	0.0	0.0
[illegible]	6	49	5	16.0	6.0	4.0	0.0	4.0	0.0	50.0	4.0	0.0	2.0	6.0	6.0	0.0	8.0	56.0	6.0	28.0
[illegible]	1	12	3	16.6	24.9	0.0	0.0	0.0	0.0	49.8	0.0	0.0	0.0	8.3	0.0	0.0	42.0	58.0	0.0	0.0
12	2*	14	3	14.2	7.1	0.0	0.0	0.0	14.2	49.7	0.0	0.0	0.0	7.1	7.1	0.0	50.0	43.0	0.0	7.0
12	3	48	12	0.0	18.0	4.0	2.0	2.0	2.0	68.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	46.0	22.0	20.0
12	4	36	1	8.4	30.8	0.0	0.0	0.0	2.8	28.0	22.4	0.0	0.0	8.4	0.0	0.0	17.0	47.0	28.0	8.0
12	5	18	8	5.6	11.2	0.0	0.0	0.0	0.0	50.4	0.0	5.6	0.0	5.6	22.4	0.0	62.0	32.0	0.0	6.0
12	6	39	5	0.0	5.2	0.0	0.0	0.0	5.2	67.6	5.2	2.6	0.0	10.4	5.2	0.0	8.0	60.0	16.0	16.0
13	1	14	6	14.2	35.5	0.0	0.0	0.0	7.1	35.5	0.0	7.1	0.0	0.0	0.0	0.0	36.0	57.0	0.0	7.0
13	2	14	6	0.0	14.2	0.0	0.0	0.0	0.0	71.0	7.1	0.0	0.0	7.1	0.0	0.0	14.0	64.0	21.0	0.0
13	3	20	4	5.0	35.0	5.0	0.0	0.0	0.0	35.0	10.0	5.0	0.0	5.0	0.0	0.0	55.0	35.0	0.0	10.0
13	4	17	3	5.9	17.7	5.9	0.0	0.0	5.9	17.7	5.9	11.8	0.0	23.6	5.9	0.0	47.0	41.0	0.0	12.0
13	5	25	2	8.0	16.0	0.0	0.0	0.0	0.0	52.0	0.0	8.0	0.0	12.0	4.0	0.0	60.0	32.0	0.0	8.0
13	6	18	6	0.0	11.2	0.0	16.8	0.0	0.0	56.0	0.0	5.6	0.0	11.2	0.0	0.0	28.0	62.0	11.0	0.0
14	1	16	2	12.6	25.2	0.0	0.0	0.0	0.0	18.9	6.3	0.0	6.3	31.5	0.0	0.0	63.0	37.0	0.0	0.0
14	2	21	4	14.4	14.4	0.0	4.8	4.8	4.8	38.4	4.8	4.8	0.0	4.8	4.8	0.0	66.0	29.0	5.0	0.0
14	3*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	4	23	2	4.3	30.1	0.0	0.0	0.0	8.6	47.3	0.0	0.0	0.0	8.6	0.0	0.0	9.0	77.0	14.0	0.0
14	5*	17	7	0.0	0.0	0.0	5.9	0.0	0.0	82.6	11.8	0.0	0.0	0.0	0.0	0.0	24.0	46.0	24.0	6.0
14	6*	20	2	10.0	25.0	0.0	0.0	5.0	0.0	20.0	10.0	15.0	0.0	10.0	5.0	0.0	30.0	45.0	15.0	10.0
15	1*	9	12	11.0	11.0	0.0	11.0	0.0	0.0	55.0	0.0	0.0	0.0	0.0	11.0	0.0	66.0	33.0	0.0	0.0
15	2	19	8	0.0	15.9	0.0	0.0	0.0	5.3	63.6	0.0	0.0	0.0	10.6	5.3	0.0	21.0	41.0	11.0	27.0
15	3	27	1	18.5	18.5	0.0	0.0	0.0	11.1	22.2	0.0	0.0	18.5	11.1	0.0	0.0	11.0	63.0	11.0	15.0
15	4	34	9	8.7	14.5	0.0	5.8	0.0	2.9	66.7	0.0	0.0	0.0	0.0	0.0	0.0	20.0	50.0	15.0	15.0
15	5	18	3	22.4	5.6	5.6	0.0	0.0	0.0	33.6	22.4	0.0	0.0	11.2	0.0	0.0	17.0	34.0	11.0	40.0
15	6	19	3	5.3	37.1	5.3	0.0	0.0	0.0	21.2	21.2	0.0	0.0	5.3	5.3	0.0	37.0	53.0	5.0	5.0
16	1	26	5	7.6	7.6	0.0	3.8	3.8	0.0	53.2	7.6	0.0	0.0	11.4	7.6	0.0	30.0	62.0	8.0	0.0
16	2	8	11	0.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	0.0	0.0	25.0	0.0	0.0	12.0	50.0	0.0	38.0
16	3*	29	5	17.0	40.0	10.2	0.0	6.8	0.0	13.6	3.4	0.0	3.4	0.0	3.4	0.0	34.0	63.0	0.0	3.0
16	4	22	4	0.0	9.0	0.0	0.0	0.0	9.0	45.0	9.0	0.0	13.5	9.0	4.5	0.0	9.0	77.0	5.0	9.0
16	5	18	5	5.6	22.4	0.0	0.0	0.0	5.6	50.4	5.6	0.0	0.0	11.2	0.0	0.0	44.0	39.0	6.0	11.0
16	6	13	2	15.4	38.5	7.7	0.0	0.0	0.0	23.1	0.0	0.0	7.7	7.7	0.0	0.0	69.0	23.0	0.0	8.0
17	1	34	1	20.3	20.3	2.9	0.0	0.0	2.9	29.0	2.9	5.8	5.8	5.8	2.9	0.0	26.0	48.0	9.0	17.0
17	2	23	1	12.9	25.8	4.3	0.0	4.3	0.0	30.1	4.3	0.0	0.0	8.6	8.6	0.0	9.0	56.0	13.0	22.0
17	3	10	3	30.0	30.0	0.0	0.0	0.0	0.0	10.0	10.0	0.0	0.0	10.0	10.0	0.0	90.0	10.0	0.0	0.0
17	4	29	4	10.2	10.2	3.4	0.0	0.0	3.4	17.0	27.2	3.4	3.4	6.8	13.6	0.0	14.0	66.0	10.0	10.0
17	5	25	1	12.0	4.0	4.0	0.0	0.0	0.0	52.0	8.0	0.0	4.0	8.0	8.0	0.0	8.0	64.0	12.0	16.0
17	6*	26	2	7.6	26.6	0.0	0.0	0.0	3.8	45.6	3.8	3.8	0.0	7.6	0.0	0.0	15.0	58.0	8.0	19.0
18	1*	21	5	9.6	33.6	4.8	0.0	0.0	0.0	19.2	4.8	14.4	0.0	4.8	9.6	0.0	62.0	38.0	0.0	0.0
18	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	3	14	8	7.1	42.6	14.2	0.0	0.0	0.0	28.4	7.1	0.0	0.0	0.0	0.0	0.0	71.0	14.0	0.0	14.0
18	4	26	5	11.4	15.2	11.4	0.0	0.0	0.0	53.2	3.8	0.0	3.8	0.0	0.0	0.0	11.0	50.0	11.0	27.0
18	5	22	5	18.0	27.0	4.5	0.0	0.0	0.0	31.5	4.5	9.0	4.5	0.0	0.0	0.0	32.0	54.0	5.0	9.0
18	6	17	2	5.9	23.6	0.0	0.0	0.0	0.0	35.4	11.8	0.0	5.9	11.8	5.9	0.0	47.0	53.0	0.0	0.0
19	1	16	5	6.3	37.8	0.0	0.0	0.0	0.0	31.5	6.3	0.0	6.3	12.6	0.0	0.0	44.0	56.0	0.0	0.0
19	2	21	7	19.2	19.2	9.6	0.0	0.0	9.6	28.8	4.8	0.0	0.0	0.0	4.8	0.0	42.0	48.0	10.0	0.0
19	3*	32	6	9.3	21.7	6.2	0.0	6.2	0.0	27.9	6.2	6.2	3.1	3.1	12.4	0.0	60.0	28.0	3.0	9.0
19	4*	25	2	4.0	28.0	4.0	0.0	0.0	0.0	40.0	4.0	0.0	0.0	12.0	8.0	0.0	36.0	64.0	0.0	0.0
19	5	26	2	11.4	19.0	3.8	0.0	0.0	0.0	41.8	7.6	7.6	0.0	3.8	3.8	0.0	34.0	66.0	0.0	0.0
19	6	27	0	7.4	3.7	0.0	0.0	0.0	0.0	33.3	18.5	0.0	7.4	18.5	7.4	0.0	30.0	59.0	7.0	4.0
20	1	48	3	4.2	8.4	6.3	0.0	0.0	2.1	58.8	12.6	0.0	0.0	4.2	4.2	0.0	23.0	58.0	4.0	15.0
20	2	22	4	4.5	18.0	4.5	0.0	0.0	4.5	36.0	4.5	9.0	0.0	4.5	13.5	0.0	45.0	45.0	5.0	5.0
20	3*	30	5	3.3	26.4	3.3	0.0	0.0	0.0	56.1	6.6	3.3	0.0	0.0	0.0	0.0	30.0	63.0	0.0	7.0
20	4	24	7	0.0	4.2	8.4	0.0	0.0	0.0	58.8	8.4	0.0	0.0	4.2	16.8	0.0	17.0	42.0	17.0	25.0
20	5	19	1	10.6	37.1	5.3	0.0	0.0	0.0	31.8	5.3	0.0	0.0	10.6	0.0	0.0	27.0	68.0	0.0	5.0
20	6	13	7	30.8	23.1	15.4	0.0	0.0	0.0	23.1	0.0	7.7	0.0	0.0	0.0	0.0	69.0	31.0	0.0	0.0

* Subject not included in analysis.

- Indicates no data.

Table E-5

Summary of Variables for Rorschach (S) Study With Their Means and Standard Deviations
Population = 119

Variable No.	Description of Variable	Mean	Standard Deviation
01	Total No. of Responses	22.815	± 9.662
02	M%	9.353	± 7.308
03	FM%	17.916	±10.771
04	m%	2.328	± 3.527
05	k%	0.689	± 2.199
06	K%	7.824	±18.217
07	FK%	2.445	± 3.834
08	F%	42.723	±17.633
09	Fc%	5.269	± 5.692
10	c%	2.899	± 4.648
11	C'%	1.370	± 3.345
12	FC	6.697	± 6.256
13	CF	4.807	± 6.030
14	C	0.345	± 1.683
15	W%	36.218	±20.914
16	D%	48.445	±15.662
17	d%	6.487	± 7.452
18	rd%	8.748	± 8.878
19	Stress Factors	4.790	± 2.703
20	Sum C	1.714	± 1.615

Table E-6

Intercorrelations and Residuals of Variables from Rorschach (S) Study
Population = 119; Significance Levels: P = 0.05, $|r| \geq 0.19$; P = 0.01, $|r| \geq 0.25$

Residuals

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20
01		.00	-.09	.01	.04	.00	.02	.12	.09	.04	.08	.00	-.02	.00	-.03	-.02	-.09	-.05	.01	.06
02	-.18		.16	-.01	-.04	-.02	.04	-.13	-.07	-.14	-.05	-.07	-.13	.00	.07	.06	.06	.05	.01	-.02
03	-.22	.12		.06	-.03	.02	-.03	.18	.10	.16	.23	.12	-.02	-.07	-.07	-.09	-.07	-.02	-.02	.08
04	.03	.15	.13		.01	.02	-.13	-.04	-.01	-.14	-.04	-.09	-.05	.00	.06	.09	.00	.00	.02	-.03
05	.00	-.11	-.17	-.16		-.02	06	.02	.00	.02	-.03	-.05	.08	.00	-.08	.06	.03	.01	-.03	-.02
06	.22	-.01	-.03	.08	.04		-.06	-.06	-.02	-.01	-.09	.00	-.06	.01	.00	.00	.04	.00	-.02	.02
07	.04	.03	.00	-.18	-.04	-.04		-.15	-.10	-.09	-.06	-.13	.01	-.06	.06	.03	.03	.07	.07	.04
08	.31	-.47	-.53	-.19	.15	-.09	-.17		-.12	-.12	-.09	-.01	-.12	.00	.09	.03	.12	.02	.00	-.07
09	-.03	-.12	.02	.04	-.18	-.06	-.06	-.31		.01	.06	-.11	-.03	-.02	-.04	.03	.00	.00	.00	-.05
10	-.11	.03	-.02	-.09	.04	.14	.00	-.36	.06		.00	-.05	-.13	.08	.00	.00	-.01	.12	.00	-.05
11	-.03	.20	-.16	-.03	-.03	-.04	.01	-.31	.09	.25		.01	-.20	-.03	-.02	.02	.02	.08	-.08	-.01
12	-.18	-.02	-.11	-.17	-.11	-.08	-.15	-.10	-.03	-.16	.06		-.10	.07	.00	.05	.04	.15	.08	-.01
13	-.13	-.06	-.16	-.12	-.02	.03	.14	-.30	.09	.24	.07	-.07		.15	.06	.07	.01	-.03	.02	.09
14	-.03	-.17	-.06	.03	.06	.07	.07	-.03	.09	.05	-.03	-.12	.03		-.04	-.05	.03	.00	-.01	-.04
15	.52	-.32	-.23	-.05	-.06	.02	.07	.51	-.01	-.34	-.19	.07	-.41	-.08		.01	.11	.03	-.07	.03
16	.22	-.24	-.09	-.07	-.06	-.01	.03	.36	-.06	-.23	-.14	.13	-.40	-.03	.78		-.11	-.15	.08	.02
17	.46	-.23	-.20	-.15	.11	.02	.10	.33	.11	-.21	-.12	-.14	-.07	-.10	.53	.09		-.01	.00	.05
18	.43	-.11	-.21	.12	-.14	.04	.01	.29	.00	-.20	-.10	.07	-.22	-.06	.53	.03	.23		.02	.05
19	-.09	-.29	-.24	.00	.24	.07	-.05	.31	-.13	.12	-.08	-.40	.25	.22	-.15	-.27	-.01	.10		-.01
20	.25	-.17	-.27	-.08	.00	.19	.10	-.23	.11	.17	.11	.17	.72	.34	-.12	-.18	.03	-.01	.03	

Table E-7

Unrotated Factor Loadings of Rorschach (S) Study
Population = 119

Variable No.	Description of Variable	Orthogonal Factors								h^{2}*
		1	2	3	4	5	6	7	8	
01	Total No. of Responses	.63	.19	-.06	.65	.04	.30	.05	-.03	0.95
02	M%	-.50	-.19	.10	.05	.16	.44	-.06	.04	0.52
03	FM%	-.47	.42	-.06	-.13	-.02	.08	-.14	-.03	0.45
04	m%	-.19	-.17	-.14	.24	.31	-.03	-.03	.01	0.24
05	k%	.10	.07	-.26	.06	.44	-.03	.10	.08	0.30
06	K%	-.02	.12	-.06	.31	-.02	.02	-.12	.14	0.15
07	FK%	.00	.12	-.02	-.02	-.07	.05	.09	.14	0.05
08	F%	.57	.02	-.18	-.20	-.07	-.09	-.25	-.01	0.47
09	Fc%	-.11	.08	.07	-.04	.22	-.21	.52	.07	0.39
10	c%	-.44	.20	-.15	.16	-.21	.02	-.02	.38	0.47
11	C'%	-.30	.16	.12	-.01	.00	.26	.03	.26	0.27
12	FC	-.08	.10	.51	-.16	.10	-.07	-.02	-.10	0.33
13	CF	-.38	.81	-.15	-.09	-.02	.11	.07	.08	0.85
14	C	-.10	.21	-.16	.15	-.07	.37	.02	-.01	0.24
15	W%	.90	-.12	.33	.09	.22	-.13	.02	.42	<u>1.18</u>
16	D%	.60	-.22	.34	-.02	-.12	-.18	-.10	.25	0.64
17	d%	.59	.09	-.16	.12	-.16	.19	.48	-.06	0.69
18	rd%	.51	.01	-.14	.18	.51	.05	-.06	-.07	0.58
19	Stress Factors	.07	-.26	.78	.19	.02	.26	.27	.00	0.86
20	Sum C	-.15	.81	.21	.32	-.01	-.24	.06	-.09	0.89

* h^2 = Communality; underlined communality value needs final adjustment to reduce it to 1.00 or less.

APPENDIX F

Figure F-1

Sample of Physical Examination Record

Name: ______________________________ Number: ______________

Date: ______________________

General Appearance (complexion and coloring, alertness, apparent state of health, prominent physical abnormalities, etc.) -

Station and Gait -

Skin Characteristics (to include dryness or oiliness, degree of pigment, moles, etc., callosities on hands or feet, condition of finger nails, etc.) -

Eyes (physical features of, to include abnormalities such as conjunctival injection, blepharitis, ptosis, etc.) -

Nose (any abnormality) -

Neck (abnormalities or positive findings, lymphadenopathy, etc.) -

Chest - Lungs (positive findings) -

Heart (positive findings such as arythmias, etc.) -

Blood Vessels (positive findings in peripheral arteries and veins such as varicosities) -

Abdomen (scars, source of palpable organs, tenderness, etc.) -

Anal Region (skin-tabs, hemorrhoids, pruritis, evidence of pilonidal cyst, etc.) -

Genitalia (any abnormalities noted) -

Extremities (any abnormalities noted) -

Past History (activity during past 4 days, previous illnesses, previous operations, occupation prior to entry into service, recent weight gain or loss, any illness in past 2 months, etc.) -

Figure F-2

Sample of Physical Examination Form

______ (No.) ______ (Name) Age in months_____ Date_____

1. Muscular tonus 1 2 3 4 5

2. Leanness or obesity 1 2 3 4 5

3. Musculo-skeletal build 1 2 3 4 5

4. General bodily cleanliness 1 2 3 4

5. Acne 1 2 3 4

6. Perspiration, hands 1 2 3 4

7. Perspiration, axillary 1 2 3 4

8. Prominence of larynx 1 2 3 4 5

9. Genitalia

   Penis Sup-inf. _____mm. Lat. _____mm.

   Rt. Test. Lat. _____mm. Sup-inf. _____mm.

   L. Test. Lat. _____mm. Sup-inf. _____mm.

10. Varicocoele 1 2 3 4

11. Cremasteric Reflex 1 2 3 4 5

12. Rhomberg 1 2 3 4 5

13. Deep Reflexes 1 2 3 4 5

14. Tremors 1 2 3 4 5

15. General body hair distribution 1 2 3 4 5

16. Pubic hair distribution 1 2 3 4 5

17. Beard 1 2 3 4 5

18. Masculinity estimation 1 2 3 4

19. Height _______ cm.

_______ in.

20. Chest circumference (Harvard tech.) _______ cm.

21. Chest cir. (hands above head) _______ cm.

_______ in.

22. Waist circumference _______ cm.

_______ in.

23. Weight in pounds __________

24. Teeth and general mouth hygiene 1 2 3 4 5

25. Vision Rt. ____/20 L. _____/20

26. Hearing 1 normal 2 abnormal

27. Color vision 1 normal 2 abnormal

28. Cerumen 1 2 3 4 5

29. Lymph tissue present 1 2 3 4 5

30. Potential lymph tissue 1 2 3 4 5

Figure F-3

Physical Examination Criteria

1. Muscular tonus
   - 1- Extremely poor tonus
   - 2- Below average
   - 3- Average
   - 4- Above average
   - 5- Exceptionally good tonus

2. Leanness or obesity
   - 1- Fat
   - 2- Plump
   - 3- Average
   - 4- Lean
   - 5- Thin

3. Musculo-skeletal build (size not given much weight)
   - 1- Very poor
   - 2- Below average build
   - 3- No remarkable deviations noted
   - 4- Better than average build
   - 5- Definitely superior build ("Atlas type")

4. General bodily cleanliness
   - 1- Good hygiene
   - 2- Fair
   - 3- Poor
   - 4- Very poor

5. Acne
   - 1- None
   - 2- Slight
   - 3- Moderate
   - 4- Excessive

6. Perspiration - hands
   - 1- Dry.
   - 2- Palpable moisture
   - 3- Visible moisture
   - 4- Wet

7. Perspiration - axillary
   1- Dry
   2- Slight - moisture visible
   3- Moderate - beads visible
   4- Excessive - dripping and running down body

8. Prominence of larynx
   1- Much less prominent than average
   2- Less prominent than average
   3- Average
   4- More prominent than average
   5- Extremely prominent

9. Genitalia (See physical examination form - Figure F-2)

10. Varicocoele
    1- Absent
    2- Slight
    3- Moderate
    4- Excessive

11. Cremasteric reflex
    1- Absent
    2- Hypoactive
    3- Average
    4- Hyperactive
    5- Markedly hyperactive

12. Rhomberg
    1- No sway
    2- Slight sway
    3- Average
    4- Excessive sway
    5- Falls

13. Deep reflexes
    1- Elicited only with reinforcement
    2- Hypoactive
    3- No deviation from normal
    4- Hyperactive
    5- Markedly hyperactive

14. Tremors
    1- Absent
    2- Slight
    3- Average
    4- Above average
    5- Excessive

15. Body hair distribution (General)
    1- None on chest
    2- Very slight on chest
    3- Slight on chest
    4- Moderate on chest, slight on shoulders
    5- Very heavy on chest and shoulders

16. Pubic body hair distribution (Escutcheon)
    1- Distinctly feminine type
    2- Feminine trend
    3- Normal male
    4- Vertical component more pronounced than usual
    5- Vertical component very predominant

17. Beard
    1- None
    2- Less than average
    3- Average
    4- Greater than average

18. Masculinity estimation (Grant Study criteria)
    1- Very weak masculine component
    2- Weak masculine component
    3- Medium masculine component
    4- Strong masculine component

19. Height in inches

20. Chest circumference (Harvard Technique)

21. Chest circumference (Hands above head)

22. Waist circumference

23. Weight in pounds

24. Teeth and general mouth hygiene. Score on the basis of evidence of attention that has been given the mouth, i.e., cleanliness, condition of gums, missing teeth, unfilled caries, etc., on a basis of 1 (Excellent) to 5 (Very poor).

25. Visual acuity (Right and left eye)

26. Auditory acuity (Binaural)

27. Color vision

28. Cerumen
    1- None
    2- Below average
    3- Average
    4- Above average
    5- Excessive

29. Lymph tissue present
    1- None
    2- Below average
    3- Average
    4- Above average
    5- Excessive

30. Potential lymph tissue
    1- None
    2- Below average
    3- Average
    4- Above average
    5- Excessive

Table F-1

Summary of Variables for Physical Characteristics Study With Their Means and Standard Deviations
Population = 105

Variable No.	Description of Variable	Unit of Measurement	Mean	Standard Deviation
01	Muscular Tonus	5-Point Scale	3.114	± 0.540
02	Leanness or Obesity	5-Point Scale	3.010	± 0.625
03	Musculo-Skeletal Build	5-Point Scale	3.181	± 0.740
04	General Body Cleanliness	4-Point Scale	2.152	± 0.644
05	Acne	4-Point Scale	1.838	± 0.705
06	Perspiration - Hands	4-Point Scale	2.038	± 0.703
07	Perspiration - Axillary	4-Point Scale	1.990	± 0.834
08	Prominance of Larynx	4-Point Scale	3.010	± 0.750
09	Penis - Sup-Inf.	Millimeters	64.867	±11.419
10	Penis - Lateral	Millimeters	28.219	± 4.115
11	Varicocoele	4-Point Scale	1.305	± 0.619
12	Cremasteric Reflex	5-Point Scale	2.981	± 0.873
13	Rhomberg	5-Point Scale	2.905	± 0.845
14	Deep Reflexes	5-Point Scale	3.229	± 0.865
15	Tremors	5-Point Scale	3.029	± 0.833
16	General Body Hair Distribution	5-Point Scale	2.124	± 1.057
17	Pubic Hair Distribution	5-Point Scale	2.762	± 0.921
18	Beard	4-Point Scale	2.658	± 0.766
19	Cerumen	5-Point Scale	2.714	± 0.789
20	Lymph Tissue Present	5-Point Scale	2.810	± 0.718
21	Potential Lymph Tissue	5-Point Scale	3.314	± 0.760
22	Chest Circumference (hands above head)	Centimeters	88.790	± 4.626
23	Waist Circumference	Centimeters	70.895	± 4.795
24	Teeth and General Mouth Hygiene	5-Point Scale	2.486	± 0.664
25	Age	Months	223.238	±17.915
26	Total Testicular Volume	Cubic Centimeters	43.607	±14.407

Table F-1

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01	Muscular Tonus	5-Point Scale	3.114	± 0.540
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14	Deep Reflexes	5-Point Scale	3.229	± 0.865
15	Tremors	5-Point Scale	3.029	± 0.833
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26	Total Testicular Volume	Cubic Centimeters	43.607	±14.407

Table F-2

Intercorrelations and Residuals of Variables from the Physi
Population = 105; Significance Levels: P = 0.05, $|r| \geq 0.1$

Residuals

Intercorrelations: Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
01		-.01	.04	.00	-.02	.06	-.04	.02	.00	.02	.07	-.06	.02	.01	.05
02	-.09		.01	-.02	.03	.03	.00	-.02	.03	.02	.10	-.04	-.01	.02	-.02
03	.42	-.13		.04	.05	.07	-.03	.05	-.02	.03	.01	.03	-.01	.03	.01
04	.11	.14	-.04		.10	.01	.06	.05	-.01	-.02	.09	.10	-.06	.06	-.04
05	.12	.18	.15	.28		-.08	.01	.03	.05	-.05	-.09	-.01	.00	-.02	-.03
06	-.06	-.04	.02	-.08	-.16		.07	-.05	-.01	.01	.01	-.05	-.01	.08	.02
07	.04	-.15	.03	-.05	.06	.23		.00	.01	.01	-.04	.07	-.03	-.04	-.01
08	-.07	-.02	-.07	-.08	-.05	.11	.05		.02	-.02	-.03	-.03	-.03	.01	.04
09	.05	.11	-.06	.01	.09	-.05	.00	.26		.05	00	.01	.03	.01	-.03
10	-.01	-.01	.05	.04	-.02	.08	-.02	.12	.29		.00	.01	-.02	-.05	-.02
11	-.05	.07	-.24	.00	-.21	.04	-.03	.12	.07	-.03		-.05	.04	-.02	.04
12	-.22	-.12	-.02	-.16	-.18	.08	.05	.10	-.01	.00	.03		.05	.01	.04
13	.02	-.09	-.17	-.03	.05	-.06	.05	-.01	.14	.13	-.02	.02		.02	-.02
14	-.12	.07	.17	-.08	-.11	.24	-.08	.17	-.04	-.05	.05	.16	-.26		.08
15	.08	.05	-.16	.03	.07	.05	.21	.03	-.08	-.18	.06	-.04	.04	-.01	
16	.06	-.13	.29	-.14	-.13	-.03	-.10	-.06	-.10	-.04	-.07	.26	-.16	.14	-.12
17	.07	.17	.13	-.05	.12	-.04	-.02	-.11	.00	.14	-.17	-.05	.03	.08	.05
18	.10	-.23	.21	-.26	-.16	.17	.07	-.04	-.11	.01	-.02	.18	-.02	.03	.03
19	.03	-.07	.09	-.04	.10	-.07	.18	-.06	-.10	.09	-.10	-.02	.07	.07	.14
20	-.02	-.06	-.01	-.04	.11	-.08	-.08	-.03	-.12	-.10	-.17	.13	.25	-.10	-.06
21	.00	-.05	-.03	-.12	-.08	-.02	-.22	-.04	.00	-.03	-.08	.10	.18	.02	-.07
22	.29	-.52	.38	.06	-.05	-.06	.10	-.10	-.06	.06	.03	-.12	.00	-.09	-.04
23	.10	-.47	.05	.04	-.17	-.02	-.02	-.13	-.10	.00	.01	.02	.12	-.10	-.16
24	-.05	.15	-.08	.16	.03	.02	-.11	.09	.10	.07	-.15	.00	.12	-.21	.03
25	-.13	.01	-.09	-.27	-.12	.10	.00	.21	-.06	-.18	.11	.08	-.03	.13	.03
26	-.05	-.08	.06	.02	.07	.19	.04	.08	.07	.42	-.15	.04	.19	-.02	-.08

Table F-2

and Residuals of Variables from the Physical Characteristics Study
; Significance Levels: $P = 0.05, |r| \geq 0.19$; $P = 0.01, |r| \geq 0.25$

Residuals

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
.00	.02	.07	-.06	.02	.01	.05	.01	.09	.03	.01	.03	.07	-.02	-.01	-.04	-.02	-.02
.03	.02	.10	-.04	-.01	.02	-.02	.01	.08	.00	-.07	-.05	.03	-.06	.00	.06	.00	-.02
-.02	.03	.01	.03	-.01	.03	.01	.02	-.01	-.04	.04	-.03	-.03	.04	-.03	-.04	.04	-.01
-.01	-.02	.09	.10	-.06	.06	-.04	.00	-.08	.06	-.10	-.03	-.06	.01	.00	.07	-.08	.01
.05	-.05	-.09	-.01	.00	-.02	-.03	.00	.07	-.03	.02	.07	-.02	-.01	-.03	-.02	-.01	.04
-.01	.01	.01	-.05	-.01	.08	.02	-.09	-.08	.04	-.05	.01	.07	.01	.10	-.07	.01	-.01
.01	.01	-.04	.07	-.03	-.04	-.01	.06	.04	-.05	.08	.03	-.04	.00	.00	-.02	.01	.01
.02	-.02	-.03	-.03	-.03	.01	.04	-.10	-.08	-.07	-.02	.03	-.05	-.01	.00	.05	.10	.01
	.05	00	.01	.03	.01	-.03	.01	.08	.03	.01	-.04	.01	-.01	.03	-.03	-.07	-.01
.29		.00	.01	-.02	-.05	-.02	.03	.06	.07	.02	-.01	.02	.02	.01	-.05	-.10	.04
.07	-.03		-.05	.04	-.02	.04	-.08	-.07	-.03	-.03	.04	-.01	.04	-.03	-.09	.01	-.02
-.01	.00	.03		.05	.01	.04	.09	-.07	-.03	-.01	.05	-.02	-.04	.00	.01	-.08	-.01
.14	.13	-.02	.02		.02	-.02	.00	.08	.02	.04	.01	.04	-.04	.00	-.02	.00	.00
-.04	-.05	.05	.16	-.26		.08	-.08	-.08	-.03	-.03	-.07	.01	.04	.06	-.03	.09	.02
-.08	-.18	.06	-.04	.04	-.01		.01	.08	.01	.02	-.02	.06	.02	-.05	.08	.00	.01
-.10	-.04	-.07	.26	-.16	.14	-.12		.10	.08	-.03	-.09	-.03	.01	.02	.06	.06	-.02
.00	.14	-.17	-.05	.03	.08	.05	.24		-.10	-.07	.03	.05	.01	.02	-.06	-.07	.00
-.11	.01	-.02	.18	-.02	.03	.03	.55	-.01		.06	.05	.04	.00	.01	-.04	.04	-.01
-.10	.09	-.10	-.02	.07	.07	.14	.05	.09	.23		.05	.10	.07	.10	-.06	.07	-.01
-.12	-.10	-.17	.13	.25	-.10	-.06	-.07	.13	-.10	.09		.03	.10	.04	-.06	.05	.01
.00	-.03	-.08	.10	.18	.02	-.07	.05	.07	-.09	.02	.65		.04	.02	-.04	-.01	-.01
-.06	.06	.03	-.12	.00	-.09	-.04	.26	-.06	.30	.17	-.07	-.02		.07	.07	.02	.00
-.10	.00	.01	.02	.12	-.10	-.16	.14	-.09	.10	.08	.12	.18	.61		-.03	.00	-.02
.10	.07	-.15	.00	.12	-.21	.03	-.09	-.06	-.08	-.21	-.03	-.02	-.07	-.19		.09	.02
-.06	-.18	.11	.08	-.03	.13	.03	.20	-.08	.28	.04	-.02	-.04	-.07	-.03	.12		.02
.07	.42	-.15	.04	.19	-.02	-.08	.04	.15	.12	.11	.13	.02	.03	-.04	.20	.00	

Table F-2

Intercorrelations and Residuals of Variables from the Physic
Population = 105; Significance Levels: $P = 0.05, |r| \geq 0.1$

Residuals

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
01		-.01	.04	.00	-.02	.06	-.04	.02	.00	.02	.07	-.06	.02	.01	.05
02	-.09		.01	-.02	.03	.03	.00	-.02	.03	.02	.10	-.04	-.01	.02	-.02
03	.42	-.13		.04	.05	.07	-.03	.05	-.02	.03	.01	.03	-.01	.03	.01
04	.11	.14	-.04		.10	.01	.06	.05	-.01	-.02	.09	.10	-.06	.06	-.04
05	.12	.18	.15	.28		-.08	.01	.03	.05	-.05	-.09	-.01	.00	-.02	-.03
06	-.06	-.04	.02	-.08	-.16		.07	-.05	-.01	.01	.01	-.05	-.01	.08	.02
07	.04	-.15	.03	-.05	.06	.23		.00	.01	.01	-.04	.07	-.03	-.04	-.01
08	-.07	-.02	-.07	-.08	-.05	.11	.05		.02	-.02	-.03	-.03	-.03	.01	.04
09	.05	.11	-.06	.01	.09	-.05	.00	.26		.05	.00	.01	.03	.01	-.03
10	-.01	-.01	.05	.04	-.02	.08	-.02	.12	.29		.00	.01	-.02	-.05	-.02
11	-.05	.07	-.24	.00	-.21	.04	-.03	.12	.07	-.03		-.05	.04	-.02	.04
12	-.22	-.12	-.02	-.16	-.18	.08	.05	.10	-.01	.00	.03		.05	.01	.04
13	.02	-.09	-.17	-.03	.05	-.06	.05	-.01	.14	.13	-.02	.02		.02	-.02
14	-.12	.07	.17	-.08	-.11	.24	-.08	.17	-.04	-.05	.05	.16	-.26		.08
15	.08	.05	-.16	.03	.07	.05	.21	.03	-.08	-.18	.06	-.04	.04	-.01	
16	.06	-.13	.29	-.14	-.13	-.03	-.10	-.06	-.10	-.04	-.07	.26	-.16	.14	-.12
17	.07	.17	.13	-.05	.12	-.04	-.02	-.11	.00	.14	-.17	-.05	.03	.08	.05
18	.10	-.23	.21	-.26	-.16	.17	.07	-.04	-.11	.01	-.02	.18	-.02	.03	.03
19	.03	-.07	.09	-.04	.10	-.07	.18	-.06	-.10	.09	-.10	-.02	.07	.07	.14
20	-.02	-.06	-.01	-.04	.11	-.08	-.08	-.03	-.12	-.10	-.17	.13	.25	-.10	-.06
21	.00	-.05	-.03	-.12	-.08	-.02	-.22	-.04	.00	-.03	-.08	.10	.18	.02	-.07
22	.29	-.52	.38	.06	-.05	-.06	.10	-.10	-.06	.06	.03	-.12	.00	-.09	-.04
23	.10	-.47	.05	-.04	-.17	-.02	-.02	-.13	-.10	.00	.01	.02	.12	-.10	-.16
24	-.05	.15	-.08	.16	.03	.02	-.11	.09	.10	.07	-.15	.00	.12	-.21	.03
25	-.13	.01	-.09	-.27	-.12	.10	.00	.21	-.06	-.18	.11	.08	-.03	.13	.03
26	-.05	-.08	.06	.02	.07	.19	.04	.08	.07	.42	-.15	.04	.19	-.02	-.08

Table F-2

and Residuals of Variables from the Physical Characteristics Study
; Significance Levels: P = 0.05, |r| ≥ 0.19; P = 0.01, |r| ≥ 0.25

Residuals																	
09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
.00	.02	.07	-.06	.02	.01	.05	.01	.09	.03	.01	.03	.07	-.02	-.01	-.04	-.02	-.02
.03	.02	.10	-.04	-.01	.02	-.02	.01	.08	.00	-.07	-.05	.03	-.06	.00	.06	.00	-.02
-.02	.03	.01	.03	-.01	.03	.01	.02	-.01	-.04	.04	-.03	-.03	.04	-.03	-.04	.04	-.01
-.01	-.02	.09	.10	-.06	.06	-.04	.00	-.08	.06	-.10	-.03	-.06	.01	.00	.07	-.08	.01
.05	-.05	-.09	-.01	.00	-.02	-.03	.00	.07	-.03	.02	.07	-.02	-.01	-.03	-.02	-.01	.04
-.01	.01	.01	-.05	-.01	.08	.02	-.09	-.08	.04	-.05	.01	.07	.01	.10	-.07	.01	-.01
.01	.01	-.04	.07	-.03	-.04	-.01	.06	.04	-.05	.08	.03	-.04	.00	.00	-.02	.01	.01
.02	-.02	-.03	-.03	-.03	.01	.04	-.10	-.08	-.07	-.02	.03	-.05	-.01	.00	.05	.10	.01
	.05	.00	.01	.03	.01	-.03	.01	.08	.03	.01	-.04	.01	-.01	.03	-.03	-.07	-.01
.29		.00	.01	-.02	-.05	-.02	.03	.06	.07	.02	-.01	.02	.02	.01	-.05	-.10	.04
.07	-.03		-.05	.04	-.02	.04	-.08	-.07	-.03	-.03	.04	-.01	.04	-.03	-.09	.01	-.02
-.01	.00	.03		.05	.01	.04	.09	-.07	-.03	-.01	.05	-.02	-.04	.00	.01	-.08	-.01
.14	.13	-.02	.02		.02	-.02	.00	.08	.02	.04	.01	.04	-.04	.00	-.02	.00	.00
-.04	-.05	.05	.16	-.26		.08	-.08	-.08	-.03	-.03	-.07	.01	.04	.06	-.03	.09	.02
-.08	-.18	.06	-.04	.04	-.01		.01	.08	.01	.02	-.02	.06	.02	-.05	.08	.00	.01
-.10	-.04	-.07	.26	-.16	.14	-.12		.10	.08	-.03	-.09	-.03	.01	.02	.06	.06	-.02
.00	.14	-.17	-.05	.03	.08	.05	.24		-.10	-.07	.03	.05	.01	.02	-.06	-.07	.00
-.11	.01	-.02	.18	-.02	.03	.03	.55	-.01		.06	.05	.04	.00	.01	-.04	.04	-.01
-.10	.09	-.10	-.02	.07	.07	.14	.05	.09	.23		.05	.10	.07	.10	-.06	.07	-.01
-.12	-.10	-.17	.13	.25	-.10	-.06	-.07	.13	-.10	.09		.03	.10	.04	-.06	.05	.01
.00	-.03	-.08	.10	.18	.02	-.07	.05	.07	-.09	.02	.65		.04	.02	-.04	-.01	-.01
-.06	.06	.03	-.12	.00	-.09	-.04	.26	-.06	.30	.17	-.07	-.02		.07	.07	.02	.00
-.10	.00	.01	.02	.12	-.10	-.16	.14	-.09	.10	.08	.12	.18	.61		-.03	.00	-.02
.10	.07	-.15	.00	.12	-.21	.03	-.09	-.06	-.08	-.21	-.03	-.02	-.07	-.19		.09	.02
-.06	-.18	.11	.08	-.03	.13	.03	.20	-.08	.28	.04	-.02	-.04	-.07	-.08	.12		.02
.07	.42	-.15	.04	.19	-.02	-.08	.04	.15	.12	.11	.13	.02	.03	-.04	.20	.00	

Table F-2

Intercorrelations and Residuals of Variables from the Physical
Population = 105; Significance Levels: P = 0.05, |r| ≥ 0.19; P

Residuals

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
01		-.01	.04	.00	-.02	.06	-.04	.02	.00	.02	.07	-.06	.02	.01	.05	.01
02	-.09		.01	-.02	.03	.03	.00	-.02	.03	.02	.10	-.04	-.01	.02	-.02	.01
03	.42	-.13		.04	.05	.07	-.03	.05	-.02	.03	.01	.03	-.01	.03	.01	.02
04	.11	.14	-.04		.10	.01	.06	.05	-.01	-.02	.09	.10	-.06	.06	-.04	.00
05	.12	.18	.15	.28		-.08	.01	.03	.05	-.05	-.09	-.01	.00	-.02	-.03	.00
06	-.06	-.04	.02	-.08	-.16		.07	-.05	-.01	.01	.01	-.05	-.01	.08	.02	-.09
07	.04	-.15	.03	-.05	.06	.23		.00	.01	.01	-.04	.07	-.03	-.04	-.01	.06
08	-.07	-.02	-.07	-.08	-.05	.11	.05		.02	-.02	-.03	-.03	-.03	.01	.04	-.10
09	.05	.11	-.06	.01	.09	-.05	.00	.26		.05	.00	.01	.03	.01	-.03	.01
10	-.01	-.01	.05	.04	-.02	.08	-.02	.12	.29		.00	.01	-.02	-.05	-.02	.03
11	-.05	.07	-.24	.00	-.21	.04	-.03	.12	.07	-.03		-.05	.04	-.02	.04	-.08
12	-.22	-.12	-.02	-.16	-.18	.08	.05	.10	-.01	.00	.03		.05	.01	.04	.09
13	.02	-.09	-.17	-.03	.05	-.06	.05	-.01	.14	.13	-.02	.02		.02	-.02	.00
14	-.12	.07	.17	-.08	-.11	.24	-.08	.17	-.04	-.05	.05	.16	-.26		.08	-.08
15	.08	.05	-.16	.03	.07	.05	.21	.03	-.08	-.18	.06	-.04	.04	-.01		.01
16	.06	-.13	.29	-.14	-.13	-.03	-.10	-.06	-.10	-.04	-.07	.26	-.16	.14	-.12	
17	.07	.17	.13	-.05	.12	-.04	-.02	-.11	.00	.14	-.17	-.05	.03	.08	.05	.24
18	.10	-.23	.21	-.26	-.16	.17	.07	-.04	-.11	.01	-.02	.18	-.02	.03	.03	.55
19	.03	-.07	.09	-.04	.10	-.07	.18	-.06	-.10	.09	-.10	-.02	.07	.07	.14	.05
20	-.02	-.06	-.01	-.04	.11	-.08	-.08	-.03	-.12	-.10	-.17	.13	.25	-.10	-.06	-.07
21	.00	-.05	-.03	-.12	-.08	-.02	-.22	-.04	.00	-.03	-.08	.10	.18	.02	-.07	.05
22	.29	-.52	.38	.06	-.05	-.06	.10	-.10	-.06	.06	.03	-.12	.00	-.09	-.04	.26
23	.10	-.47	.05	-.04	-.17	-.02	-.02	-.13	-.10	.00	.01	.02	.12	-.10	-.16	.14
24	-.05	.15	-.08	.16	.03	.02	-.11	.09	.10	.07	-.15	.00	.12	-.21	.03	-.09
25	-.13	.01	-.09	-.27	-.12	.10	.00	.21	-.06	-.18	.11	.08	-.03	.13	.03	.20
26	-.05	-.08	.06	.02	.07	.19	.04	.08	.07	.42	-.15	.04	.19	-.02	-.08	.04

Intercorrelations

Table F-2

s and Residuals of Variables from the Physical Characteristics Study
5; Significance Levels: P = 0.05, $|r| \geq 0.19$; P = 0.01, $|r| \geq 0.25$

Residuals

09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
.00	.02	.07	-.06	.02	.01	.05	.01	.09	.03	.01	.03	.07	-.02	-.01	-.04	-.02	-.02
.03	.02	.10	-.04	-.01	.02	-.02	.01	.08	.00	-.07	-.05	.03	-.06	.00	.06	.00	-.02
-.02	.03	.01	.03	-.01	.03	.01	.02	-.01	-.04	.04	-.03	-.03	.04	-.03	-.04	.04	-.01
-.01	-.02	.09	.10	-.06	.06	-.04	.00	-.08	.06	-.10	-.03	-.06	.01	.00	.07	-.08	.01
.05	-.05	-.09	-.01	.00	-.02	-.03	.00	.07	-.03	.02	.07	-.02	-.01	-.03	-.02	-.01	.04
-.01	.01	.01	-.05	-.01	.08	.02	-.09	-.08	.04	-.05	.01	.07	.01	.10	-.07	.01	-.01
.01	.01	-.04	.07	-.03	-.04	-.01	.06	.04	-.05	.08	.03	-.04	.00	.00	-.02	.01	.01
.02	-.02	-.03	-.03	-.03	.01	.04	-.10	-.08	-.07	-.02	.03	-.05	-.01	.00	.05	.10	.01
	.05	.00	.01	.03	.01	-.03	.01	.08	.03	.01	-.04	.01	-.01	.03	-.03	-.07	-.01
.29		.00	.01	-.02	-.05	-.02	.03	.06	.07	.02	-.01	.02	.02	.01	-.05	-.10	.04
.07	-.03		-.05	.04	-.02	.04	-.08	-.07	-.03	-.03	.04	-.01	.04	-.03	-.09	.01	-.02
-.01	.00	.03		.05	.01	.04	.09	-.07	-.03	-.01	.05	-.02	-.04	.00	.01	-.08	-.01
.14	.13	-.02	.02		.02	-.02	.00	.08	.02	.04	.01	.04	-.04	.00	-.02	.00	.00
-.04	-.05	.05	.16	-.26		.08	-.08	-.08	-.03	-.03	-.07	.01	.04	.06	-.03	.09	.02
-.08	-.18	.06	-.04	.04	-.01		.01	.08	.01	.02	-.02	.06	.02	-.05	.08	.00	.01
-.10	-.04	-.07	.26	-.16	.14	-.12		.10	.08	-.03	-.09	-.03	.01	.02	.06	.06	-.02
.00	.14	-.17	-.05	.03	.08	.05	.24		-.10	-.07	.03	.05	.01	.02	-.06	-.07	.00
-.11	.01	-.02	.18	-.02	.03	.03	.55	-.01		.06	.05	.04	.00	.01	-.04	.04	-.01
-.10	.09	-.10	-.02	.07	.07	.14	.05	.09	.23		.05	.10	.07	.10	-.06	.07	-.01
-.12	-.10	-.17	.13	.25	-.10	-.06	-.07	.13	-.10	.09		.03	.10	.04	-.06	.05	.01
.00	-.03	-.08	.10	.18	.02	-.07	.05	.07	-.09	.02	.65		.04	.02	-.04	-.01	-.01
-.06	.06	.03	-.12	.00	-.09	-.04	.26	-.06	.30	.17	-.07	-.02		.07	.07	.02	.00
-.10	.00	.01	.02	.12	-.10	-.16	.14	-.09	.10	.08	.12	.18	.61		-.03	.00	-.02
.10	.07	-.15	.00	.12	-.21	.03	-.09	-.06	-.08	-.21	-.03	-.02	-.07	-.19		.09	.02
-.06	-.18	.11	.08	-.03	.13	.03	.20	-.08	.28	.04	-.02	-.04	-.07	-.08	.12		.02
.07	.42	-.15	.04	.19	-.02	-.08	.04	.15	.12	.11	.13	.02	.03	-.04	.20	.00	

Table F-3

Rotated Factor Loadings of Physical Characteristics Study
Population = 105

Variable No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	9	10	h2*
01	Muscular Tonus	-.02	.08	-.09	.06	.03	.03	-.11	.55	.07	-.03	.34
02	Leanness or Obesity	-.12	-.64	-.03	.05	.09	-.04	-.02	.03	.08	.08	.45
03	Musculo-Skeletal Build	-.07	.17	.04	.19	.09	-.09	.04	.73	-.30	.14	.73
04	General Body Cleanliness	-.10	-.12	-.09	-.11	-.05	-.05	.12	.21	.11	-.56	.43
05	Acne	.03	-.22	-.03	-.08	-.12	.00	-.04	.32	.10	-.11	.20
06	Perspiration - Hands	.47	.03	-.08	.15	.14	.04	.15	-.18	-.18	-.03	.36
07	Perspiration - Axillary	.50	.10	-.15	-.12	-.14	.05	-.04	.16	-.01	.13	.36
08	Prominance of Larynx	.14	-.04	.02	.09	.03	.48	-.06	-.18	-.17	.03	.33
09	Penis - Sup-Inf.	-.09	-.15	-.05	-.08	.10	.57	-.05	.08	.03	.02	.39
10	Penis - Lateral	-.15	.01	-.08	-.12	-.03	.42	.54	.05	-.04	.04	.52
11	Varicocoele	-.01	.06	-.18	-.01	.00	.15	-.21	-.33	-.07	.00	.22
12	Cremasteric Reflex	.06	.09	.15	.19	.09	.13	.00	-.28	-.10	.11	.20
13	Rhomberg	.09	.04	.19	-.17	-.07	.16	.15	.02	.41	.07	.30
14	Deep Reflexes	.06	-.13	.07	.19	-.13	.00	-.01	-.13	-.67	.03	.55
15	Tremors	.34	-.14	-.13	.07	-.14	-.07	-.19	.00	.22	-.08	.27
16	General Body Hair Distribution	-.10	.28	.13	.63	.02	-.06	-.04	.01	-.14	.00	.53
17	Pubic Hair Distribution	-.02	-.13	.10	.21	-.15	-.09	.23	.08	-.16	.00	.19
18	Beard	.13	.29	-.12	.69	-.11	-.05	.02	.01	.12	.36	.75
19	Cerumen	.08	.02	-.02	.14	-.52	-.06	.17	.08	.00	-.03	.34
20	Lymph Tissue Present	.04	-.07	.88	-.10	-.15	-.11	.04	.09	.15	.05	.86
21	Potential Lymph Tissue	-.09	.08	.69	-.08	.09	.00	-.06	-.05	.02	-.03	.51
22	Chest Circumference (hands above head)	-.06	.77	-.17	.12	-.08	.07	-.05	.36	.05	.01	.79
23	Waist Circumference	-.14	.75	.10	-.15	-.08	-.07	-.03	.01	.06	-.05	.63
24	Teeth and General Mouth Hygiene	.01	-.16	.02	.11	.36	.13	.19	.03	.24	-.11	.29
25	Age	.07	-.03	-.05	.27	.04	.05	-.10	-.25	.04	.16	.19
26	Total Testicular Volume	.12	.01	.12	.15	-.01	.22	.59	.05	.10	.05	.46

* h^2 = Communality.

Table F-4

Summary of Anthropometric Measurements

Group No.	Subject No.	Age (yr)	Weight (lb)	Height (cm)	Chest Breadth (cm)	Chest Depth (cm)	Chest Circumference (cm)	Chest Circumference (hands above head) (cm)	Waist Circumference (cm)	Calf Circumference (cm)	Biacromial (cm)	Bi-iliac (cm)	Head Circumference (cm)	Face Breadth (cm)	Hand Length (cm)	Hand Breadth (cm)	Penis Sup. Inf. (cm)	Penis Lateral (cm)	Right Testicle Sup. Inf. (cm)	Right Testicle Lateral (cm)	Left Testicle Sup. Inf. (cm)	Left Testicle Lateral (cm)
01	1*	17	-	180.3	-	-	-	-	-	-	-	-	-	-	-	-	78	35	54	37	50	37
01	2*	21	184	171.2	-	-	-	-	-	-	-	-	-	-	-	-	50	30	50	32	47	30
01	3*	18	137	172.7	-	-	-	-	-	-	-	-	-	-	-	-	74	28	44	30	50	32
01	4*	18	125	170.8	-	-	-	-	-	-	-	-	-	-	-	-	78	33	45	33	45	30
01	5*	26	169	171.1	-	-	-	-	-	-	-	-	-	-	-	-	73	30	50	33	51	30
01	6*	18	150	176.5	-	-	-	-	-	-	-	-	-	-	-	-	58	34	43	27	47	32
02	1	18	156	160.8	30.4	21.7	90.3	92.4	80.2	39.9	38.6	27.7	55.1	14.0	17.3	8.9	51	29	33	22	48	31
02	2	18	140	173.5	27.4	20.2	83.6	84.7	74.5	34.5	38.2	26.6	55.1	13.6	18.4	8.3	75	31	46	28	47	33
02	3	18	155	172.9	30.3	21.1	92.0	94.4	73.0	34.9	40.7	27.4	57.0	14.2	19.3	9.2	70	32	50	35	45	30
02	4	18	151	164.8	29.0	22.0	86.1	90.6	74.0	36.0	38.7	26.5	57.2	13.3	17.6	8.8	40	26	45	32	47	32
02	5*	18	154	178.1	29.7	22.5	-	-	-	-	41.4	28.5	57.2	-	-	-	-	-	-	-	-	-
02	6	17	136	177.0	27.0	20.1	82.5	85.9	70.6	33.7	37.4	28.3	56.2	13.4	19.4	8.7	73	30	50	32	44	31
03	1	18	152	178.7	27.3	19.8	86.6	87.5	73.8	35.1	40.0	30.6	56.6	13.4	20.2	8.8	78	30	51	35	49	32
03	2	18	111	164.9	25.7	19.9	79.5	80.0	65.0	34.8	35.0	26.0	55.9	12.3	17.1	7.6	76	27	41	26	42	29
03	3	17	174	173.3	31.2	19.4	94.8	96.5	76.0	38.4	42.3	29.4	58.5	14.1	19.3	9.0	83	34	50	39	48	32
03	4	18	129	172.5	26.1	18.5	79.4	81.8	68.0	33.5	38.2	28.4	56.5	13.4	18.0	8.5	60	29	47	30	42	30
03	5	18	148	180.2	27.8	21.5	87.0	86.8	71.5	34.4	39.6	28.9	57.2	13.2	20.6	9.0	60	31	41	28	44	29
03	6	19	144	179.0	29.2	21.5	85.8	91.3	68.4	33.0	41.0	28.1	55.6	13.4	18.3	8.3	58	30	49	37	50	38
04	1	18	131	173.2	24.6	19.2	80.5	82.5	69.2	34.0	38.2	29.0	54.5	13.7	18.2	7.7	45	24	42	28	44	32
04	2	18	146	171.7	27.5	21.2	87.0	91.2	73.5	34.5	40.9	27.9	56.1	13.5	19.9	9.2	80	28	44	31	42	27
04	3	21	169	175.8	29.1	23.3	92.2	95.5	74.5	36.2	43.0	28.9	57.5	14.6	19.7	9.2	62	33	42	32	45	32
04	4*	21	149	180.0	29.6	19.8	86.9	89.0	67.8	37.2	39.8	28.0	58.9	13.9	19.7	9.0	68	32	51	37	51	35
04	5	21	158	171.7	29.5	22.5	91.6	92.5	77.5	35.2	39.0	27.5	57.6	14.2	19.2	8.6	50	31	36	22	39	23
04	6	18	156	172.7	29.5	20.7	90.6	91.0	73.0	38.9	40.0	29.8	56.6	13.3	18.8	8.5	68	30	40	26	40	27
05	1	19	149	180.5	26.4	19.7	86.3	86.0	66.2	36.8	40.7	28.3	55.8	13.5	19.1	8.4	62	31	44	30	46	31
05	2*	18	112	158.4	25.5	19.5	81.6	82.7	67.0	35.5	35.6	25.3	52.5	12.3	17.3	7.9	65	26	44	30	44	31
05	3*	18	122	165.5	25.0	18.9	81.0	84.0	64.8	32.9	38.7	25.3	54.4	12.9	19.1	8.1	55	26	42	30	42	30
05	4	22	144	169.5	27.5	19.4	84.5	86.5	74.0	35.1	41.5	28.1	55.5	13.7	18.3	8.6	60	23	39	23	43	23
05	5	18	138	163.1	27.9	20.5	88.0	88.0	69.5	36.7	37.9	27.0	54.0	13.6	18.0	8.2	70	32	47	35	49	35
05	6	18	173	182.9	30.3	22.3	98.5	95.2	78.5	39.8	41.5	28.5	55.8	13.6	19.5	9.2	58	23	40	27	42	24
06	1	17	146	180.4	21.3	18.2	79.4	81.5	70.9	34.9	37.6	26.7	56.3	13.0	19.4	8.5	78	25	45	28	46	28
06	2	17	157	183.4	29.5	19.7	86.5	89.0	75.4	35.2	43.9	30.4	57.0	14.0	19.6	8.4	80	31	45	30	44	29
06	3	17	155	168.6	30.6	23.2	94.7	93.2	70.0	38.2	38.0	27.0	54.9	13.8	19.1	8.2	75	27	43	34	41	31
06	4	18	138	171.4	30.3	19.8	88.5	86.4	73.8	33.6	40.7	26.5	53.4	13.0	19.9	8.6	70	25	53	36	48	39
06	5	17	145	172.6	27.4	21.0	85.3	89.4	69.0	35.1	40.3	26.2	57.0	13.9	18.3	9.2	83	31	41	29	45	29
06	6	17	122	166.3	25.9	20.0	80.1	81.2	64.0	33.1	36.7	25.1	52.8	12.8	17.7	8.1	70	30	44	31	44	31
07	1*	18	147	176.6	27.4	19.1	85.8	87.8	69.3	35.0	39.5	29.2	57.5	14.1	19.3	8.8	70	-	52	37	51	39
07	2*	18	156	174.5	30.5	20.2	93.0	93.7	74.5	37.8	42.5	27.2	55.1	12.7	19.7	8.3	58	22	46	31	40	28
07	3	18	151	166.0	26.7	19.0	87.5	88.0	72.3	36.5	38.7	27.0	56.8	13.8	17.2	8.6	68	28	50	36	45	30
07	4*	18	199	187.6	30.4	22.6	96.5	97.8	81.2	39.9	41.6	29.6	56.4	14.6	20.9	8.8	60	29	48	33	56	36
07	5	18	162	184.1	27.8	21.6	88.0	89.5	73.5	36.8	42.6	29.3	55.3	13.7	20.8	8.6	83	26	47	30	46	28
07	6	18	130	165.2	28.0	20.1	85.9	86.2	63.6	32.8	37.2	25.7	57.3	13.8	18.7	8.5	60	31	50	34	51	34
08	1	18	175	189.2	27.7	21.5	86.8	90.0	69.2	39.0	44.0	30.2	56.0	13.9	19.6	9.3	68	30	46	31	46	30
08	2	17	150	177.2	28.4	21.6	89.0	88.5	71.3	36.3	39.5	27.5	55.6	13.5	19.9	8.5	85	29	46	30	44	27
08	3	18	147	169.3	27.5	19.8	86.6	87.6	69.0	35.5	40.6	25.6	55.4	13.7	19.4	8.6	57	22	45	26	40	25
08	4	20	144	173.6	28.0	21.6	88.0	91.6	62.6	34.8	39.4	27.0	56.0	14.3	19.2	8.4	62	32	42	31	46	31
08	5*	19	190	190.0	32.0	23.5	97.8	100.2	75.8	37.6	41.9	29.3	57.0	14.4	19.1	8.8	70	25	46	28	51	29
08	6*	18	136	170.5	26.3	20.1	85.5	87.5	64.3	34.0	38.2	27.9	56.0	13.4	18.4	8.2	80	27	43	20	43	25
09	1*	17	149	177.3	27.2	20.3	87.8	86.9	69.8	35.7	40.0	29.1	54.6	13.5	19.2	8.4	80	32	52	41	-	-
09	2	18	144	176.5	27.4	20.2	83.5	84.5	67.8	36.0	42.0	27.4	54.0	13.4	20.3	8.7	83	32	46	31	45	32
09	3*	20	138	167.2	27.3	20.0	85.9	84.8	75.9	34.4	39.9	25.7	52.3	12.4	18.2	8.1	55	24	44	30	44	25
09	4*	18	186	174.9	30.0	22.3	94.4	93.9	78.0	39.2	41.5	27.0	58.0	13.5	19.5	8.9	65	25	42	27	43	25
09	5	18	157	176.6	28.3	20.2	89.1	93.1	69.6	35.0	38.0	27.9	57.8	14.2	19.3	8.7	63	28	55	44	54	42
09	6*	24	127	179.4	26.7	16.4	76.5	79.3	65.9	32.1	40.3	27.5	56.3	13.1	19.2	8.3	75	25	45	33	44	30
10	1	18	183	183.9	28.9	20.0	89.0	91.5	81.4	37.8	42.5	30.0	57.0	14.2	21.0	9.0	47	27	50	31	51	32
10	2	18	149	174.3	26.5	19.6	85.0	85.0	73.5	37.0	38.1	29.2	54.6	13.5	19.1	8.8	54	30	52	36	53	31
10	3	18	146	172.0	28.3	20.4	86.2	87.0	74.6	37.9	38.6	29.1	55.8	13.9	19.7	9.0	80	56	55	34	53	36
10	4	18	153	178.1	28.0	20.0	85.2	86.2	69.2	35.2	40.3	27.1	54.1	14.3	19.5	9.4	52	30	44	29	42	28
10	5	18	175	182.9	30.0	21.1	92.3	92.8	75.2	35.5	41.2	28.3	57.9	13.3	20.7	8.7	67	29	43	35	49	36
10	6	18	167	178.5	28.7	22.0	94.9	94.1	74.8	34.0	43.1	29.9	57.4	13.5	19.6	9.0	68	31	46	27	41	25
11	1	18	137	172.8	27.0	19.3	85.0	84.0	70.2	33.3	39.4	27.3	56.1	13.7	18.5	8.2	50	23	49	31	46	30
11	2	18	155	171.0	29.8	21.3	90.8	89.2	70.0	36.8	40.0	28.2	56.7	14.1	19.3	9.2	82	32	50	36	48	29
11	3	18	141	178.2	28.9	20.1	85.3	86.5	67.0	32.9	39.2	27.5	56.2	13.9	19.4	8.9	93	31	43	26	42	28
11	4*	22	210	180.8	32.7	24.0	99.9	101.5	83.3	38.0	42.1	28.9	58.5	14.8	20.1	9.7	58	26	53	38	49	31
11	5	18	186	175.9	28.6	22.6	96.2	95.2	81.9	38.6	39.1	28.9	55.2	14.1	19.2	8.8	50	20	38	25	39	22
11	6	18	152	176.2	28.2	20.8	78.5	91.4	67.2	34.7	41.0	27.4	55.3	13.4	18.6	8.9	60	28	57	32	47	29
12	1	23	142	174.4	25.3	21.0	85.3	85.0	67.0	35.4	34.0	25.3	59.0	13.7	18.8	8.6	73	30	56	37	53	39
12	2*	22	150	172.6	30.0	19.6	89 2	88.7	76.1	36.6	40.6	30.0	58.0	15.1	20.0	8.8	58	20	45	26	44	25
12	3	18	190	178.4	30.7	23.5	97.7	95.5	81.3	38.7	38.1	29.8	57.2	14.8	18.9	8.8	30	24	37	24	38	27
12	4	18	174	185.2	31.3	21.2	92.5	94.5	75.2	36.8	44.0	30.5	58.2	13.8	19.9	8.5	80	25	40	25	47	23
12	5	18	123	170.5	26.9	18.1	80.0	83.0	62.0	33.0	38.3	26.2	53.2	13.2	18.4	7.7	40	24	42	26	41	24
12	6	18	136	168.5	26.9	20.0	84.2	87.9	65.3	33.8	38.1	27.0	56.2	13.4	19.1	8.9	65	27	42	27	41	26
13	1	17	129	173.7	26.1	21.2	85.9	86.6	64.1	31.6	38.9	27.2	54.3	12.8	19.8	8.4	70	30	45	29	44	30
13	2	17	165	179.4	30.5	18.8	89.0	93.9	69.9	35.0	42.1	30.5	58.5	14.4	20.3	9.7	42	31	47	32	46	30
13	3	18	168	189.3	28.8	20.8	88.8	89.8	68.9	37.8	40.0	31.6	54.0	13.7	20.3	9.1	60	28	44	26	44	27
13	4	21	135	168.6	28.2	19.6	86.8	90.0	67.3	33.7	39.5	28.2	55.4	13.5	18.9	8.3	88	26	48	28	44	32
13	5	21	170	181.9	30.2	21.8	91.3	95.9	71.5	35.8	43.4	27.0	59.6	13.9	20.2	9.1	56	30	47	35	48	36

07	2*	18	156	174.5	30.5	20.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
07	3	18	151	166.0	28.7	19.0	87.5	88.0	72.3	36.5	38.7	27.0	56.8	13.8	17.2	8.6	68	28	50	36	45	30
07	4*	18	199	187.6	30.4	22.6	96.5	97.8	81.2	39.9	41.6	29.6	56.4	14.6	20.9	8.8	60	29	48	33	56	36
07	5	18	162	184.1	27.8	21.6	88.0	89.5	73.5	36.8	42.6	29.3	55.3	13.7	20.8	8.6	83	26	47	30	46	28
07	6	18	130	165.2	28.0	20.1	85.9	86.2	63.6	32.8	37.2	25.7	57.3	13.8	18.7	8.5	60	31	50	34	51	34
08	1	18	175	189.2	27.7	21.5	86.8	90.0	69.2	39.0	44.0	30.2	56.0	13.9	19.6	9.3	68	30	46	31	46	38
08	2	17	150	177.2	28.4	21.6	89.0	88.5	71.3	36.3	39.5	27.5	55.6	13.5	19.9	8.5	85	29	46	30	44	27
08	3	18	147	169.3	27.5	19.8	86.6	87.6	69.0	35.5	40.6	25.6	55.4	13.7	19.4	8.6	57	22	45	26	40	28
08	4	20	144	173.6	28.0	21.6	88.0	91.6	62.6	34.8	39.4	27.0	56.0	14.3	19.2	8.4	62	32	42	31	46	31
08	5*	19	190	190.0	32.0	23.5	97.8	100.2	75.8	37.6	41.9	29.3	57.0	14.4	19.1	8.8	70	25	46	28	51	29
08	6*	18	136	170.5	26.3	20.1	85.5	87.5	64.3	34.0	38.2	27.9	56.0	13.4	18.4	8.2	80	27	43	20	43	25
09	1*	17	149	177.3	27.2	20.3	87.8	86.9	69.8	35.7	40.0	29.1	54.6	13.5	19.2	8.4	80	32	52	41	-	-
09	2	18	144	176.5	27.4	20.2	83.5	84.5	67.8	36.0	42.0	27.4	54.0	13.4	20.3	8.7	83	32	46	31	45	32
09	3*	20	138	167.2	27.3	20.0	85.9	84.8	75.9	34.4	39.9	25.7	52.3	12.4	18.2	8.1	55	24	44	30	44	25
09	4*	18	186	174.9	30.0	22.3	94.4	93.9	78.0	39.2	41.5	27.0	58.0	13.5	19.5	8.9	65	25	42	27	43	25
09	5	18	157	176.6	28.3	20.2	89.1	93.1	69.6	35.0	38.0	27.9	57.8	14.2	19.3	8.7	63	28	55	44	54	42
09	6*	24	127	179.4	26.7	16.4	76.5	79.3	65.9	32.1	40.3	27.5	56.3	13.1	19.2	8.3	75	25	45	33	44	30
10	1	18	183	183.9	28.9	20.0	89.0	91.5	81.4	37.8	42.5	30.0	57.0	14.2	21.0	9.0	47	27	50	31	51	32
10	2	18	149	174.3	26.5	19.6	85.0	85.0	73.5	37.0	38.1	29.2	54.6	13.5	19.1	8.8	54	30	52	36	53	31
10	3	18	146	172.0	28.3	20.4	86.2	87.0	74.6	37.9	38.6	29.1	55.8	13.9	19.7	9.0	80	56	55	34	53	36
10	4	18	153	178.1	28.0	20.0	85.2	86.2	69.2	35.2	40.3	27.1	54.1	14.3	19.5	9.4	52	30	44	29	42	28
10	5	18	175	182.9	30.0	21.1	92.3	92.8	75.2	35.5	41.2	28.3	57.9	13.3	20.7	8.7	67	29	43	35	49	36
10	6	18	167	178.5	28.7	22.0	94.9	94.1	74.8	34.0	43.1	29.9	57.4	13.5	19.6	9.0	68	31	46	27	41	25
11	1	18	137	172.8	27.0	19.3	85.0	84.0	70.2	33.3	39.4	27.3	56.1	13.7	18.5	8.2	50	23	49	31	46	30
11	2	18	155	171.0	29.8	21.3	90.8	89.2	70.0	36.8	40.0	28.2	56.7	14.1	19.3	9.2	82	32	50	36	48	29
11	3	18	141	178.2	28.9	20.1	85.3	86.5	67.0	32.9	39.2	27.5	56.2	13.9	19.4	8.9	93	31	43	26	42	28
11	4*	22	210	180.8	32.7	24.0	99.9	101.5	83.3	38.0	42.1	28.9	58.5	14.8	20.1	9.7	58	26	53	38	49	31
11	5	18	186	175.9	28.6	22.6	96.2	95.2	81.9	38.6	39.1	28.9	55.2	14.1	19.2	8.8	50	20	38	25	39	22
11	6	18	152	176.2	28.2	20.8	78.5	91.4	67.2	34.7	41.0	27.4	55.3	13.4	18.6	8.9	60	28	57	32	47	29
12	1	23	142	174.4	25.3	21.0	85.3	85.0	67.0	35.4	34.0	25.3	59.0	13.7	18.8	8.6	73	30	56	37	53	39
12	2*	22	150	172.6	30.0	19.6	89 2	88.7	76.1	36.6	40.6	30.0	58.0	15.1	20.0	8.8	58	20	45	26	44	25
12	3	18	190	178.4	30.7	23.5	97.7	95.5	81.3	38.7	38.1	29.8	57.2	14.8	18.9	8.8	30	24	37	24	38	27
12	4	•18	174	185.2	31.3	21.2	92.5	94.5	75.2	36.8	44.0	30.5	58.2	13.8	19.9	8.5	80	25	40	25	47	23
12	5	18	123	170.5	26.9	18.1	80.0	83.0	62.0	33.0	38.3	26.2	53.2	13.2	18.4	7.7	40	24	42	26	41	24
12	6	18	136	168.5	26.9	20.0	84.2	87.9	65.3	33.8	38.1	27.0	56.2	13.4	19.1	8.9	65	27	42	27	41	26
13	1	17	129	173.7	26.1	21.2	85.9	86.6	64.1	31.6	38.9	27.2	54.3	12.8	19.8	8.4	70	30	45	29	44	30
13	2	17	165	179.4	30.5	18.8	89.0	93.9	69.9	35.0	42.1	30.5	58.5	14.4	20.3	9.7	42	31	47	32	46	30
13	3	18	168	189.3	28.8	20.8	88.8	89.8	68.9	37.8	40.0	31.6	54.0	13.7	20.3	9.1	60	28	44	26	44	27
13	4	21	135	168.6	28.2	19.6	86.8	90.0	67.3	33.2	39.5	28.2	55.4	13.5	18.9	8.3	88	26	48	28	44	32
13	5	21	170	181.9	30.2	21.8	91.3	95.9	71.5	35.8	43.4	27.0	59.6	13.9	20.2	9.1	56	30	47	35	48	36
13	6	18	140	168.9	28.3	20.1	85.0	85.8	69.5	33.2	37.2	28.5	54.8	13.5	19.3	8.1	58	31	47	34	49	33
14	1	18	162	177.8	30.2	22.2	93.5	92.5	72.2	36.9	40.7	29.4	57.1	13.7	19.0	8.5	56	27	47	36	48	33
14	2	23	134	161.4	26.0	20.0	82.4	86.5	66.0	35.8	40.3	26.6	55.5	14.4	16.4	7.6	50	24	47	29	44	31
14	3*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	4	19	136	168.4	25.2	20.3	82.5	85.3	62.3	33.0	38.0	26.4	56.1	13.4	18.7	8.2	60	29	44	32	46	30
14	5*	17	149	170.0	26.7	20.9	87.0	90.1	72.5	35.1	38.9	27.8	57.2	13.8	18.4	8.7	70	27	47	30	40	30
14	6*	23	163	165.0	28.9	22.0	94.0	92.5	74.5	38.1	41.3	28.5	57.5	14.6	17.6	8.4	55	27	45	30	46	32
15	1*	18	157	177.9	31.6	23.3	99.0	94.5	71.0	37.1	40.6	26.8	55.5	13.9	19.5	9.2	52	29	46	33	49	34
15	2	17	147	175.2	28.7	21.3	88.2	88.7	67.1	35.5	39.5	27.2	56.8	13.6	18.8	8.3	60	32	43	32	45	33
15	3	18	177	185.5	29.5	21.0	91.1	92.0	72.6	38.3	39.5	29.2	57.0	13.9	20.8	8.8	70	27	47	29	37	27
15	4	18	146	175.2	26.2	20.6	83.0	84.3	71.0	35.5	37.9	27.2	54.2	13.5	18.6	9.0	60	26	36	23	39	28
15	5	19	147	179.6	27.5	18.2	81.8	90.0	72.0	35.9	38.7	30.0	55.1	13.3	19.7	8.6	70	27	44	28	43	28
15	6	18	165	182.0	28.0	22.5	89.3	84.1	70.4	36.0	40.8	30.1	56.0	13.8	19.7	9.0	65	30	40	32	44	31
16	1	18	140	185.1	26.6	20.3	86.4	79.2	69.5	32.6	42.4	29.4	55.4	13.2	19.8	8.7	61	27	44	32	44	31
16	2	19	118	166.0	25.5	19.0	79.6	87.8	67.3	30.2	36.7	27.5	54.6	12.9	17.7	8.2	65	30	45	32	46	34
16	3*	19	132	166.1	27.6	18.5	84.4	82.9	74.5	32.7	38.5	26.1	53.1	12.8	18.5	7.8	75	29	47	33	46	35
16	4	18	199	182.7	33.2	23.0	98.9	94.6	82.8	39.5	41.7	31.0	56.5	14.5	20.2	9.2	90	31	47	32	49	29
16	5	18	134	175.5	28.0	18.6	84.7	85.7	68.4	33.9	39.1	25.5	56.7	13.5	20.2	8.2	62	25	45	34	47	31
16	6	18	185	182.0	31.4	22.0	94.2	96.2	76.0	37.2	43.0	29.1	57.7	14.7	19.6	9.2	58	28	44	26	43	28
17	1	17	136	175.5	25.6	19.6	81.0	85.7	65.0	31.1	38.9	24.8	55.5	13.2	19.5	8.2	60	30	49	35	45	34
17	2	19	158	166.5	28.6	21.5	91.0	92.5	73.0	37.8	40.2	27.8	56.7	13.7	18.6	8.3	56	30	44	35	45	34
17	3	19	142	172.8	26.5	20.2	84.5	85.5	68.2	33.1	38.8	26.0	56.5	13.7	18.3	8.3	58	18	42	25	45	24
17	4	18	145	167.6	28.4	20.8	89.7	89.5	67.5	34.1	37.2	25.5	56.5	14.2	19.1	9.3	55	27	44	30	46	29
17	5	18	162	172.0	29.2	21.9	91.5	92.5	74.0	36.0	40.0	27.8	56.0	13.3	19.4	8.8	70	24	47	34	46	33
17	6*	18	168	177.1	27.6	21.0	91.0	89.0	76.0	37.0	37.7	28.7	55.5	12.9	19.9	9.0	60	30	51	40	-	-
18	1*	19	160	176.5	28.7	20.2	91.0	90.0	73.4	36.3	40.1	28.1	54.7	13.6	20.3	9.0	65	27	48	30	43	31
18	2*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	3	20	124	161.2	25.0	19.5	79.5	83.0	61.0	33.7	36.5	25.8	53.6	13.1	17.9	8.0	73	24	48	32	44	25
18	4	18	170	182.0	28.7	20.5	88.7	89.0	76.7	37.4	41.8	29.5	56.0	13.2	20.5	9.1	66	33	54	36	51	36
18	5	18	171	185.0	29.6	22.6	93.3	90.9	71.0	37.1	37.5	28.4	56.5	14.5	20.4	9.1	65	31	52	32	44	32
18	6	18	166	179.5	28.8	20.4	89.7	90.5	75.5	36.3	41.5	27.1	57.5	13.9	19.2	8.5	58	29	51	30	50	26
19	1	19	163	176.6	30.3	22.1	94.0	97.5	74.0	34.5	40.5	27.6	57.7	13.9	19.2	8.6	65	26	41	28	46	27
19	2	18	196	172.1	32.0	23.0	99.9	99.0	77.9	40.2	40.6	27.0	57.0	14.5	20.3	9.6	58	28	44	33	44	30
19	3*	24	122	166.5	26.6	18.3	82.2	81.8	65.7	33.3	38.2	27.8	54.4	12.3	18.2	8.2	70	25	40	25	37	25
19	4*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	5	17	125	169.5	25.7	18.5	78.0	82.1	61.0	32.9	37.5	26.0	53.9	13.4	19.5	8.2	58	20	40	22	41	24
19	6	19	185	188.0	30.5	22.3	93.9	95.8	80.3	37.5	43.5	27.9	57.4	13.8	19.0	8.3	65	26	41	25	36	21
20	1	17	162	187.0	28.1	22.0	88.5	92.4	67.2	33.7	41.6	28.5	56.9	14.2	20.1	9.0	78	29	46	30	43	36
20	2	19	148	178.0	27.6	21.0	84.0	87.3	70.9	34.0	40.5	29.3	55.5	13.7	19.0	8.1	65	24	43	26	44	29
20	3*	18	147	179.5	27.8	23.5	88.7	89.0	67.0	34.7	38.5	27.2	55.6	13.7	20.6	9.1	70	27	40	23	39	21
20	4	18	148	168.4	27.2	22.4	89.4	90.0	70.7	35.6	39.7	26.0	55.6	14.3	18.6	8.3	57	31	45	35	45	31
20	5	18	155	175.0	30.5	20.5	95.6	97.1	72.0	37.1	41.0	26.4	54.7	13.7	19.3	8.4	80	30	47	27	44	26
20	6	17	147	168.4	27.4	21.3	87.0	89.0	75.0	35.1	37.6	28.5	56.0	13.3	19.4	8.6	60	32	44	31	43	31

* Subject not included in analysis.

\- Indicates no data.

Table F-5

Summary of Individual Anthropometric Indices

Group No.	Subject No.	No. Disproportions	Stature / $\sqrt[3]{\text{Weight}}$	Biacromial / Chest Cir.	Chest Breadth / Biacromial	Chest Depth / Biacromial	Bi-iliac / Biacromial	Head Cir. / Chest Cir.	Chest Cir. / Stature	Calf Cir. / Biacromial	Face Breadth / Chest Breadth	Hand Area / Body Weight	Bi-iliac / Chest Breadth
01	1*	-	-	-	-	-	-	-	-	-	-	-	-
01	2*	-	-	-	-	-	-	-	-	-	-	-	-
01	3*	-	-	-	-	-	-	-	-	-	-	-	-
01	4*	-	-	-	-	-	-	-	-	-	-	-	-
01	5*	-	-	-	-	-	-	-	-	-	-	-	-
01	6*	-	-	-	-	-	-	-	-	-	-	-	-
02	1	0	11.7	43	79	56	72	61	56	103	46	99	91
02	2	3	13.1	46	72	53	70	66‡	48‡	90	50‡	109	97
02	3	1	12.6	44	74	52	67	62	53	86	47	115‡	90
02	4	1	12.1	45	75	57	68	66‡	52	93	46	103	91
02	5*	0	13.0	44	72	54	69	61	53	87	44	105	96
02	6	7	13.5‡	45	72	54	76‡	68‡	47‡	90	50‡	124‡	105‡
03	1	6	13.1	46	68‡	50	76‡	65‡	48‡	88	49	117‡	112‡
03	2	4	13.5‡	44	73	57	74	70‡	48‡	99	48	117‡	101
03	3	1	12.1	45	74	46‡	70	62	55	91	45	100	94
03	4	7	13.4	48‡	68‡	48	74	71‡	46‡	88	51‡	118‡	109‡
03	5	5	13.3	46	70‡	54	73	66‡	48‡	87	47	125‡	104‡
03	6	4	13.4	48‡	71	52	69	65‡	48‡	80‡	46	105	96
04	1	6	13.4	47	64‡	50	76‡	67‡	46‡	89	56‡	107	118‡
04	2	4	12.8	47	67‡	52	68	64‡	51	84‡	49	125‡	101
04	3	3	12.5	47	68‡	54	67	62	52	84‡	50‡	107	99
04	4*	3	13.3	46	74	50	70	68‡	48‡	93	47	119‡	95
04	5	0	12.4	43	76	58	70	63	53	90	48	104	93
04	6	0	12.6	44	74	52	74	62	52	97	45	102	101
05	1	5	13.3	47	65‡	48	70	65‡	48‡	90	51‡	108	107‡
05	2*	2	12.9	44	72	55	71	64‡	52	100	48	121‡	99
05	3*	6	13.1	48‡	65‡	49	65	67‡	49	85‡	52‡	126‡	101
05	4	6	12.7	49‡	66‡	47‡	68	66‡	50	85‡	50‡	109	102
05	5	0	12.4	43	74	54	71	61	54	97	49	107	97
05	6	0	12.9	42	73	54	69	57	54	96	45	104	94
06	1	3	13.4	47	73	48	71	71‡	44‡	93	48	113‡	98
06	2	7	13.3	51‡	67‡	45‡	69	66‡	47‡	80‡	47	105	103‡
06	3	0	12.3	40	81	61	71	58	56	101	45	101	88
06	4	2	13.0	46	74	49	65	60	52	83‡	43	124‡	87
06	5	4	12.9	47	68‡	52	65	67‡	49	87	51‡	116‡	96
06	6	3	13.1	46	71	54	68	66‡	48‡	90	49	118‡	97
07	1*	5	13.1	46	69‡	48	74	67‡	49	89	51‡	116‡	107‡
07	2*	0	12.7	46	72	48	64	59	53	89	42	105	89
07	3	1	12.2	44	74	49	70	65‡	53	94	48	98	94
07	4*	0	12.6	43	73	54	71	58	51	96	48	92	97
07	5	5	13.2	48‡	65‡	51	69	63	48‡	86	49	110‡	105‡
07	6	2	12.8	43	75	54	69	67‡	52	88	49	122‡	92
08	1	6	13.3	51‡	63‡	49	69	65‡	46‡	89	50‡	104	109‡
08	2	1	13.1	44	72	55	70	62	50	92	48	113‡	97
08	3	4	12.6	47	68‡	49	63	64‡	51	87	50‡	113‡	93
08	4	3	13.0	45	71	55	69	64‡	51	88	51‡	112‡	96
08	5*	0	13.0	43	76	56	70	58	51	90	45	88	92
08	6*	5	13.0	45	69‡	53	73	65‡	50	89	51‡	111‡	106‡
09	1*	3	13.1	46	68‡	51	73	62	50	89	50	108	107‡
09	2	5	13.2	50‡	65‡	48	65	65‡	47‡	86	49	123‡	100
09	3*	1	12.7	46	68‡	50	64	61	51	86	45	107	94
09	4*	0	12.0	44	72	54	65	61	54	94	45	93	90
09	5	2	12.8	43	74	53	73	65‡	50	92	50‡	107	98
09	6*	9	14.0‡	53‡	66‡	41‡	68	74‡	43‡	80‡	49	125‡	103‡
10	1	6	12.7	48‡	68‡	47‡	71	64‡	48‡	89	49	103	104‡
10	2	6	12.9	45	70‡	51	77‡	64‡	49	97	51‡	113‡	110‡
10	3	4	12.8	45	73	53	75‡	65‡	50	98	49	121‡	103‡
10	4	4	13.1	47	69‡	50	67	63	48‡	87	51‡	120‡	97
10	5	0	12.8	45	73	51	69	63	50	86	44	103	94
10	6	3	12.7	45	67‡	51	69	60	53	79‡	47	106	104‡
11	1	5	13.2	46	68‡	49	69	66‡	49	85‡	51‡	111‡	101
11	2	1	12.5	44	74	53	70	62	53	92	47	115‡	95
11	3	5	13.5‡	46	74	51	70	66‡	48‡	84‡	48	122‡	95
11	4*	0	11.9	42	78	57	69	58	56	90	45	93	88
11	5	0	12.1	41	73	58	74	57	55	99	49	91	101
11	6	5	12.9	52‡	69‡	51	67	70‡	45‡	85‡	48	109	97
12	1	3	13.1	40	74	62	74	69‡	49	104	54‡	114‡	100
12	2*	3	12.7	46	74	48	74	65‡	52	90	50‡	118‡	100
12	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					

08	2	1	13.1	44	72	55	70	62	50	92	[illegible]	[illegible]	[illegible]
08	3	4	12.6	47	68‡	49	63	64‡	51	87	50‡	113‡	93
08	4	3	13.0	45	71	55	69	64‡	51	88	51‡	112‡	96
08	5*	0	13.0	43	76	56	70	58	51	90	45	88	92
08	6*	5	13.0	45	69‡	53	73	65‡	50	89	51‡	111‡	106‡
09	1*	3	13.1	46	68‡	51	73	62	50	89	50	108	107‡
09	2	5	13.2	50‡	65‡	48	65	65‡	47‡	86	49	123‡	100
09	3*	1	12.7	46	68‡	50	64	61	51	86	45	107	94
09	4*	0	12.0	44	72	54	65	61	54	94	45	93	90
09	5	2	12.8	43	74	53	73	65‡	50	92	50‡	107	98
09	6*	9	14.0‡	53‡	66‡	41‡	68	74‡	43‡	80‡	49	125‡	103‡
10	1	6	12.7	48‡	68‡	47‡	71	64‡	48‡	89	49	103	104‡
10	2	6	12.9	45	70‡	51	77‡	64‡	49	97	51‡	113‡	110‡
10	3	4	12.8	45	73	53	75‡	65‡	50	98	49	121‡	103‡
10	4	4	13.1	47	69‡	50	67	63	48‡	87	51‡	120‡	97
10	5	0	12.8	45	73	51	69	63	50	86	44	103	94
10	6	3	12.7	45	67‡	51	69	60	53	79‡	47	106	104‡
11	1	5	13.2	46	68‡	49	69	66‡	49	85‡	51‡	111‡	101
11	2	1	12.5	44	74	53	70	62	53	92	47	115‡	95
11	3	5	13.5‡	46	74	51	70	66‡	48‡	84‡	48	122‡	95
11	4*	0	11.9	42	78	57	69	58	56	90	45	93	88
11	5	0	12.1	41	73	58	74	57	55	99	49	91	101
11	6	5	12.9	52‡	69‡	51	67	70‡	45‡	85‡	48	109	97
12	1	3	13.1	40	74	62	74	69‡	49	104	54‡	114‡	100
12	2*	3	12.7	46	74	48	74	65‡	52	90	50‡	118‡	100
12	3	1	12.2	39	80	62	78‡	59	55	102	48	88	97
12	4	2	13.0	48‡	71	48	69	63	50	84‡	44	97	97
12	5	6	13.4	48‡	70‡	47‡	68	66‡	47‡	86	49	115‡	97
12	6	3	12.8	45	71	52	71	67‡	50	89	50‡	125‡	100
13	1	5	13.5‡	45	67‡	54	70	63	49	81‡	49	129‡	104‡
13	2	4	12.8	47	72	45‡	72	66‡	50	83‡	47	119‡	100
13	3	4	13.4	45	72	52	79‡	61	47‡	94	48	110‡	110‡
13	4	3	12.9	46	71	50	71	64‡	61	84‡	48	116‡	100
13	5	4	12.8	48‡	70‡	50	62	65‡	50	82‡	46	108	89
13	6	3	12.8	44	76	54	77‡	64‡	50	89‡	48	112‡	101
14	1	0	12.8	44	74	55	72	61	53	91	45	100	97
14	2	4	12.4	49‡	64‡	50	66	67‡	51	89	55‡	93	102
14	3*	-	-	-	-	-		-	-	-	-	-	-
14	4	5	12.8	46	66‡	53	69	68‡	49	87	53‡	113‡	105‡
14	5*	4	12.6	45	69‡	54	71	66‡	51	90	52‡	107	104‡
14	6*	2	11.8	44	70‡	53	69	61	57	92	50‡	91	99
15	1*	1	12.9	41	78	57	66	56	56	91	44	114‡	85
15	2	1	13.0	45	73	54	69	64‡	50	90	47	106	95
15	3	0	13.0	43	75	53	74	63	49	97	47	103	99
15	4	6	13.0	46	69‡	54	72	65‡	47‡	94	52‡	115‡	104‡
15	5	6	13.3	47	71	47‡	78‡	67‡	46‡	93	48	115‡	109‡
15	6	2	13.0	46	69‡	55	74	63	49	88	49	107	108‡
16	1	9	14.0‡	49‡	63‡	48	69	64‡	47‡	77‡	50‡	123‡	110‡
16	2	8	13.3	46	69‡	52	75‡	68‡	48‡	82‡	50‡	123‡	108‡
16	3*	1	12.8	46	72	48	68	63	51	85‡	46	109	94
16	4	0	12.3	42	80	55	74	57	54	95	44	93	93
16	5	4	13.5‡	46	72	48	65	67‡	48‡	87	48	123‡	91
16	6	0	12.5	46	73	51	68	61	52	86	47	97	93
17	1	7	13.4	48‡	66‡	50	64	69‡	46‡	80‡	52‡	118‡	97
17	2	0	12.1	44	71	53	69	62	55	94	48	98	97
17	3	4	13.0	46	68‡	52	67	67‡	49	85‡	52‡	107	98
17	4	2	12.5	41	76	56	69	63	54	92	50‡	122‡	90
17	5	0	12.4	44	73	55	70	61	53	90	46	105	95
17	6*	2	12.6	41	73	56	76‡	61	51	98	47	107	104‡
18	1*	1	12.7	44	72	50	70	60	52	90	47	114‡	98
18	2*	-	-	-	-	-	-	-	-	-	-	-	-
18	3	5	12.7	46	68‡	53	71	67‡	49	92	52‡	115‡	103‡
18	4	3	12.9	47	69‡	49	70	63	49	89	46	110‡	103‡
18	5	1	13.1	40	79	60	76‡	61	50	99	49	109	96
18	6	2	12.8	46	69‡	49	65	64‡	50	87	48	98	94
19	1	1	12.7	43	75	54	68	61	53	85‡	46	101	91
19	2	0	11.6	40	79	57	66	57	58	99	45	99	84
19	3*	4	13.2	46	70‡	48	73	66‡	49	87	46	122‡	104‡
19	4*	-	-	-	-	-	-	-	-	-	-	-	-
19	5	6	13.3	48‡	68‡	49	69	69‡	46‡	88	52‡	128‡	101
19	6	1	12.9	46	70‡	51	64	61	50	86	45	85	91
20	1	7	13.5‡	47	68‡	53	68	64‡	47‡	81‡	50‡	112‡	101
20	2	7	13.2	48‡	68‡	52	72	66‡	47‡	84‡	50‡	104	106‡
20	3*	1	13.4	43	72	61	71	63	49	90	49	128‡	98
20	4	2	12.5	44	68‡	56	65	62	53	90	52‡	104	96
20	5	0	12.8	43	74	50	64	57	55	90	45	104	86
20	6	4	12.5	43	73	57	76‡	64‡	52	93	48	113‡	104‡

* Subject not included in analysis.
\- Indicates no data.
‡ Disproportions.

Figure F-4

Sample of Anthropometric Tabulation Form

ANTHROPOMETRY

PROFILE OF BODY PROPORTIONS

Name .... Group .... Date ....
(last) (initials)

........Age

........Weight

........Muscle Tonus																			+++	
........Stature/$\sqrt[3]{Wt.}$ I.	11.3	11.4	11.5	11.6	11.7	11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12.7	12.8	12.9	13.0	13.1	1
........Biac./Chest C.I.										35	36	37	38	39	40	41	42	43	44	
........Chest Br./Biac. I.					88	87	86	85	84	83	82	81	80	79	78	77	76	75	74	
........Chest D./Biac. I.				66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	
........Bi-iliac/Biac. I.								60	61	62	63	64	65	66	67	68	69	70	71	
........Head C./Chest C.I.									.50	51	52	53	54	55	56	57	58	59	60	
........Chest C./Stature I.							64	63	62	61	60	59	58	57	56	55	54	53	52	
........Calf C/Biac. I.	107	106	105	104	103	102	101	100	99	98	97	96	95	94	93	92	91	90	89	
........Face Br./Chest Br.I												39	40	41	42	43	44	45	46	
Hand Area/Body Wt.I.						76	78	80	82	84	86	88	90	92	94	96	98	100	102	1
						77	79	81	83	85	87	89	91	93	95	97	99	101	103	1
Bi-iliac/Chest Br.I.									75	77	79	81	83	85	87	89	91	93	95	
									76	78	80	82	84	86	88	90	92	94	96	

........Hand Length

........Hand Breadth

Somatotype: Pyknic 1 – 2 – 3 – 4 – 5

Somatic 1 – 2 – 3 – 4 – 5

Leptic 1 – 2 – 3 – 4 – 5

Androgyny: 1 – 2 – 3 – 4 – 5

Notes: ....
....
....
....
....

1

Figure F-4

Sample of Anthropometric Tabulation Form

ANTHROPOMETRY

PROFILE OF BODY PROPORTIONS

up .... Date .... Photo No. ....

													+++	++		+	sm	ssm								
11.8	11.9	12.0	12.1	12.2	12.3	12.4	12.5	12.6	12 7	12.8	12.9	13.0	13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	14.0	14.1	14.2	14.3	14.4
.	.	.	.	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55		
87	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64	63	62	
64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	
.	.	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84
.	.	.	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	
.	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	
102	101	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	
.	.	.	.	.	.	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	
76 77	78 79	80 81	82 83	84 85	86 87	88 89	90 91	92 93	94 95	96 97	98 99	100 101	102 103	104 105	106 107	108 109	110 111	112 113	114 115	116 117	118 119	120 121	122 123	124 125	126 127	
.	.	.	75 76	77 78	79 80	81 82	83 84	85 86	87 88	89 90	91 92	93 94	95 96	97 98	99 100	101 102	103 104	105 106	107 108	109 110	111 112	113 114	115 116	117 118	119 120	

Notes: ....

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Grant Study
Harvard University

Table F-6

Summary of Individual Somatotype Data

Group No.	Subject No.	Regions I	II	III	IV	V	Somatotype	Dysplasias	Masculine Component	Somatotype Summary
01	1*	3 6 2	4 6 1	4 5 2	4 6 1	3 6 2	4 6 1	5	strong	Meso‡ dominant with Endo‡ higher than Ecto‡
01	2*	3 5 3	3 5 1	4 5 1	3 6 2	3 5 2	3 5 2	6	"	Meso dominant with Endo higher than Ecto
01	3*	3 5 3	2 4 4	2 4 5	3 4 4	1 5 4	3 4 4	7	"	No component dominant - Meso and Ecto equal (lower Endo)
01	4*	3 5 2	3 5 3	2 5 3	3 6 2	3 5 3	3 5 3	5	"	Meso dominant with Ecto and Endo equal
01	5*	4 4 3	4 6 2	4 5 2	4 5 2	4 5 2	4 5 2	4	"	Meso dominant - Endo higher than Ecto
01	6*	2 5 3	2 4 5	3 4 3	2 4 5	2 4 4	2 4 4	6	"	No component dominant - Meso and Ecto equal (lower Endo)
02	1	2 6 2	2 7 1	3 7 1	3 6 1	3 7 1	3 7 1	5	"	Meso dominant - Endo higher than Ecto
02	2	1 4 5	1 4 5	2 3 5	1 4 5	3 4 5	2 4 5	5	"	Ecto dominant - Meso higher than Endo
02	3	3 5 2	3 6 2	3 6 3	2 5 2	2 5 2	3 5 2	5	"	Meso dominant - Endo higher than Ecto
02	4	2 6 1	2 7 2	2 6 2	2 6 2	2 6 1	2 6 2	4	"	Meso dominant - Ecto and Endo equal
02	5*	-	-	-	-	-	-	-	-	-
02	6	2 4 6	2 5 4	2 5 4	2 4 4	1 4 5	2 4 5	6	strong	Ecto dominant - Meso higher than Endo
03	1	2 4 5	1 3 6	1 3 6	1 3 6	1 4 5	1 4 5	5	"	Ecto dominant - Meso higher than Endo
03	2	2 3 5	2 3 5	2 5 4	2 3 5	2 4 4	2 3 5	5	"	Ecto dominant - Meso higher than Endo
03	3	2 6 2	2 6 2	3 6 2	3 6 1	2 6 1	2 6 2	4	"	Meso dominant - Ecto and Endo equal
03	4	2 4 4	2 4 4	2 5 3	2 4 4	3 5 4	2 4 4	5	"	No component dominant - Meso and Ecto equal (lower Endo)
03	5	2 6 3	2 4 4	2 5 4	2 5 3	2 5 3	2 5 3	5	"	Meso dominant - Ecto higher than Endo
03	6	2 6 2	3 5 2	2 6 3	2 3 5	2 4 4	2 5 3	7	"	Meso dominant - Ecto higher than Endo
04	1	3 5 3	3 5 4	2 5 4	3 4 4	1 4 5	2 4 4	7	"	No component dominant - Ecto and Meso equal (lower Endo)
04	2	2 5 [illegible]	2 6 2	2 6 2	3 5 3	2 5 4	2 5 3	6	"	Meso dominant - Ecto higher than Endo
04	3	3 6 [illegible]	3 6 2	3 6 1	4 4 3	3 5 1	3 5 2	7	"	Meso dominant - Endo higher than Ecto
04	4*	2 3 [illegible]	2 3 5	2 4 5	2 3 5	2 5 3	2 3 5	6	"	Ecto dominant - Meso higher than Endo
04	5	3 6 [illegible]	3 5 2	3 6 2	3 6 2	3 6 1	3 6 2	3	"	Meso dominant - Endo higher than Ecto
04	6	3 6 [illegible]	3 6 2	4 5 2	4 5 2	4 6 1	4 6 2	5	"	Meso dominant - Endo higher than Ecto
05	1	2 5 [illegible]	2 5 4	2 5 4	3 5 4	3 5 4	2 5 4	4	"	Meso dominant - Ecto higher than Endo
05	2*	2 5 2	2 6 3	2 5 3	2 4 2	2 5 3	2 5 3	5	"	Meso dominant - Ecto higher than Endo
05	3*	3 5 2	2 5 2	3 5 3	3 5 4	2 5 4	2 5 3	6	"	Meso dominant - Ecto higher than Endo
05	4	2 6 1	2 6 2	2 5 3	2 5 3	1 6 3	2 6 2	6	"	Meso dominant - Ecto and Endo equal
05	5	3 5 3	3 4 4	3 4 4	3 5 2	3 5 2	3 5 3	6	"	Meso dominant - Ecto and Endo equal
05	6	3 6 2	2 6 2	3 5 2	4 5 2	2 6 2	3 6 2	5	"	Meso dominant - Endo higher than Ecto
06	1	2 4 5	2 2 5	2 3 5	3 2 5	2 4 5	2 3 5	5	"	Ecto dominant - Meso higher than Endo
06	2	2 6 2	3 5 2	2 5 4	4 4 3	2 4 5	3 5 3	7	"	Meso dominant - Ecto and Endo equal
06	3	2 6 1	1 7 1	3 6 2	2 6 1	2 6 2	2 6 2	6	"	Meso dominant - Ecto and Endo equal
06	4	3 5 2	3 5 2	3 5 3	3 5 3	3 5 4	3 5 3	4	"	Meso dominant - Ecto and Endo equal
06	5	2 5 3	3 5 2	3 5 2	2 5 3	3 5 2	3 5 3	4	"	Meso dominant - Ecto and Endo equal
06	6	3 5 3	3 5 2	2 6 2	3 4 3	3 5 3	3 5 3	6	"	Meso dominant - Ecto and Endo equal
07	1*	2 5 3	2 5 4	2 3 5	2 3 5	2 4 5	2 4 4	7	"	No component dominant - Meso and Ecto equal (lower Endo)
07	2*	2 6 1	2 6 2	3 6 2	2 6 2	2 5 2	2 6 2	4	"	Meso dominant - Ecto and Endo equal
07	3	3 6 2	3 5 3	3 6 1	4 5 2	3 6 2	3 6 2	6	"	Meso dominant - Endo higher than Ecto
07	4*	3 5 2	3 5 2	3 5 3	4 5 3	3 5 4	3 5 3	5	"	Meso dominant - Ecto and Endo equal
07	5	3 6 3	2 5 4	2 5 4	3 4 5	2 5 4	2 5 4	7	"	Meso dominant - Ecto higher than Endo
07	6	2 7 1	1 6 2	1 6 3	1 6 3	2 6 3	1 6 3	6	"	Meso dominant - Ecto higher than Endo
08	1	3 5 3	2 4 4	2 5 4	3 5 4	3 5 3	3 5 4	5	"	Meso dominant - Ecto higher than Endo
08	2	3 5 3	3 4 4	3 5 4	3 4 4	2 6 3	3 5 4	6	"	Meso dominant - Ecto higher than Endo
08	3	3 6 2	3 6 3	3 6 2	3 5 3	3 5 4	3 5 3	5	"	Meso dominant - Ecto and Endo equal
08	4	1 6 2	2 5 3	3 4 4	2 3 5	2 4 4	2 5 3	7	"	Meso dominant - Ecto higher than Endo
08	5*	3 6 2	3 6 2	4 5 1	3 5 3	3 5 3	3 5 2	6	"	Meso dominant - Endo higher than Ecto
08	6*	3 5 4	2 5 4	2 4 4	3 5 4	2 5 3	2 5 4	5	"	Meso dominant - Ecto higher than Endo
09	1*	4 5 3	3 5 3	3 4 4	3 4 5	3 4 4	3 4 4	6	"	No component dominant - Meso and Ecto equal (lower Endo)
09	2	2 6 3	3 5 4	3 4 3	2 4 5	2 6 3	2 5 4	7	"	Meso dominant - Ecto higher than Endo
09	3*	2 6 3	4 4 3	2 4 4	4 4 3	2 5 4	3 5 3	7	"	Meso dominant - Ecto and Endo equal
09	4*	3 6 2	4 6 1	2 7 1	3 7 1	3 7 1	3 6 1	6	"	Meso dominant - Endo higher than Ecto
09	5	3 6 2	2 5 3	2 5 3	3 6 2	3 5 3	3 6 2	6	"	Meso dominant - Endo higher than Ecto
09	6*	1 [illegible] 6	1 2 6	2 3 6	2 2 6	1 2 7	1 2 6	5	"	Ecto dominant - Meso higher than Endo
10	1	3 6 2	3 6 1	3 6 [illegible]	3 6 1	3 6 2	3 6 2	3	"	Meso dominant - Endo higher than Ecto
10	2	3 5 3	3 5 4	2 5 4	3 5 3	2 5 3	3 5 3	4	"	Meso dominant - Ecto and Endo equal
10	3	2 5 3	3 5 2	3 5 2	2 5 3	2 6 3	2 5 2	5	"	Meso dominant - Ecto and Endo equal
10	4	3 6 2	2 5 3	2 5 3	3 4 4	3 4 4	2 5 3	7	"	Meso dominant - Ecto higher than Endo
10	5	3 6 2	2 6 2	2 6 2	3 6 2	2 5 4	2 6 2	6	"	Meso dominant - Ecto and Endo equal
10	6	4 5 3	2 5 3	3 5 4	3 5 4	2 5 4	3 5 4	5	"	Meso dominant - Ecto higher than Endo
11	1	3 4 3	2 5 4	2 4 5	2 4 5	2 4 5	2 4 4	6	"	No component dominant - Meso and Ecto equal (lower Endo)

11	1	3 4 3	2 5 4	2 4 5	2 4 5	2 4 5	2 4 4	6	"	No component dominant - Meso and Ecto equal (lower Endo)
11	2	3 5 3	2 6 2	2 5 4	2 5 3	2 5 3	2 5 3	5	"	Meso dominant - Ecto higher than Endo
11	3	2 5 4	2 4 4	2 4 4	2 4 4	2 4 4	2 4 4	2	"	No component dominant - Meso and Ecto equal (lower Endo)
11	4*	5 4 2	5 5 1	4 5 1	5 4 2	5 4 3	5 4 2	6	"	Endo dominant - Meso higher than Ecto
11	5	4 4 3	4 3 2	5 4 2	6 3 2	5 3 2	5 3 2	6	weak	Endo dominant - Meso higher than Ecto
11	6	2 4 5	1 5 4	1 5 4	1 6 3	1 4 5	1 5 4	6	strong	Meso dominant - Ecto higher than Endo
12	1	2 5 4	2 5 3	2 5 4	2 4 4	3 5 3	2 5 4	5	"	Meso dominant - Ecto higher than Endo
12	2*	3 5 4	2 3 5	2 4 4	3 4 4	2 5 3	2 4 4	7	"	No component dominant - Meso and Ecto equal (lower Endo)
12	3	4 4 2	4 5 2	4 5 2	5 4 2	4 5 2	4 5 2	4	weak	Meso dominant - Endo higher than Ecto
12	4	3 5 3	2 5 3	1 5 4	2 4 4	2 5 4	2 5 4	6	strong	Meso dominant - Ecto higher than Endo
12	5	3 4 4	2 4 5	2 4 4	2 4 4	3 4 4	2 4 4	4	"	No component dominant - Meso and Ecto equal (lower Endo)
12	6	2 6 3	2 6 3	2 5 3	3 5 3	3 5 4	2 5 3	5	"	Meso dominant - Ecto higher than Endo
13	1	2 3 5	2 2 5	2 2 5	2 3 5	2 2 5	2 3 5	3	"	Ecto dominant - Meso higher than Endo
13	2	3 5 3	4 5 2	2 6 3	3 5 3	2 5 4	3 5 3	7	"	Meso dominant - Endo and Ecto equal
13	3	3 4 4	2 3 5	2 3 4	2 3 5	2 3 5	2 3 5	5	"	Ecto dominant - Meso higher than Endo
13	4	3 5 3	2 6 3	2 6 2	2 5 4	2 4 5	2 5 3	7	"	Meso dominant - Ecto higher than Endo
13	5	3 7 3	3 6 2	2 6 2	2 6 1	3 5 4	3 6 2	7	"	Meso dominant - Endo higher than Ecto
13	6	3 5 3	3 4 4	3 5 4	3 4 4	3 5 3	3 4 4	4	"	No component dominant - Meso and Ecto equal (lower Endo)
14	1	3 5 3	3 4 4	3 4 4	3 5 4	3 5 4	3 5 4	4	"	Meso dominant - Ecto higher than Endo
14	2	2 5 3	3 5 4	3 5 3	3 5 2	4 5 2	3 5 3	6	"	Meso dominant - Endo and Ecto equal
14	3*	-	-	-	-	-	-	-	-	-
14	4	3 5 4	2 4 5	3 4 4	3 3 4	3 3 4	3 4 4	6	strong	No component dominant - Meso and Ecto equal (lower Endo)
14	5*	3 5 3	3 4 4	3 4 4	4 5 3	3 4 4	3 4 4	5	"	No component dominant - Meso and Ecto equal (lower Endo)
14	6*	3 6 2	3 6 1	3 7 1	3 7 1	2 7 2	3 6 1	5	"	Meso dominant - Endo higher than Ecto
15	1*	2 4 4	3 6 3	3 4 4	3 5 3	3 5 4	3 5 4	6	"	Meso dominant - Ecto higher than Endo
15	2	3 5 3	2 5 4	2 5 4	2 4 4	2 4 4	2 4 4	5	"	No component dominant - Meso and Ecto equal (lower Endo)
15	3	3 5 3	3 4 4	2 6 3	2 5 4	4 4 3	3 5 3	7	"	Meso dominant - Endo and Ecto equal
15	4	3 4 4	2 3 5	2 4 3	3 4 4	2 5 4	2 4 4	7	"	No component dominant - Meso and Ecto equal (lower Endo)
15	5	2 3 5	2 2 6	1 3 5	1 3 6	2 3 5	2 3 6	5	"	Ecto dominant - Meso higher than Endo
15	6	2 4 4	2 5 4	3 4 4	2 4 4	2 5 4	2 5 4	4	"	Meso dominant - Ecto higher than Endo
16	1	2 3 5	1 2 6	2 2 6	2 2 6	1 2 7	2 2 6	6	"	Ecto dominant - Endo and Meso equal
16	2	3 2 5	2 2 5	2 2 5	3 2 5	3 3 5	3 2 5	4	"	Ecto dominant - Endo higher than Meso
16	3*	2 5 3	3 3 4	2 3 5	2 4 4	2 3 5	2 4 4	7	"	No component dominant - Meso and Ecto equal (lower Endo)
16	4	2 6 3	3 6 2	3 6 2	3 6 1	3 6 3	3 6 2	5	"	Meso dominant - Endo higher than Ecto
16	5	2 4 4	2 2 5	2 4 4	2 2 6	2 3 5	2 3 5	7	"	Ecto dominant - Meso higher than Endo
16	6	2 6 2	2 7 1	2 6 2	3 7 1	1 7 2	2 5 2	6	"	Meso dominant - Endo and Ecto equal
17	1	2 4 4	2 4 4	2 4 4	2 4 4	2 4 5	2 4 4	2	"	No component dominant - Meso and Ecto equal (lower Endo)
17	2	3 5 2	3 6 2	2 7 2	2 7 1	2 6 3	3 6 2	7	"	Meso dominant - Endo higher than Ecto
17	3	2 5 3	2 5 4	2 4 4	2 5 4	2 4 4	2 5 4	4	"	Meso dominant - Ecto higher than Endo
17	4	2 5 3	3 6 3	3 6 2	2 6 2	2 6 3	2 6 3	5	"	Meso dominant - Ecto higher than Endo
17	5	2 6 2	2 6 2	1 6 2	2 5 3	1 7 1	2 6 2	7	"	Meso dominant - Endo and Ecto equal
17	6*	2 5 3	2 4 4	2 5 3	2 5 3	2 5 4	2 5 3	4	"	Meso dominant - Ecto higher than Endo
18	1*	2 6 3	2 6 2	1 7 2	2 5 4	3 5 4	2 6 3	7	"	Meso dominant - Ecto higher than Endo
18	2*	-	-	-	-	-	-	-	-	-
18	3	2 5 3	3 4 4	1 5 4	3 4 4	3 5 3	2 5 4	7	strong	Meso dominant - Ecto higher than Endo
18	4	2 6 3	3 5 4	2 5 4	3 4 4	2 4 4	2 5 3	7	"	Meso dominant - Ecto higher than Endo
18	5	2 5 3	2 4 4	2 5 3	2 4 4	3 5 3	2 5 4	5	"	Meso dominant - Ecto higher than Endo
18	6	2 4 4	2 4 4	3 4 4	3 3 4	3 4 4	3 4 4	4	"	No component dominant - Meso and Ecto equal (lower Endo)
19	1	4 5 2	4 5 2	3 4 3	5 5 2	3 4 4	4 4 3	7	"	No component dominant - Endo and Meso equal (lower Ecto)
19	2	4 6 1	4 6 1	3 6 1	4 6 1	4 6 1	4 6 1	2	"	Meso dominant - Endo higher than Ecto
19	3*	2 3 5	1 4 6	2 3 4	2 2 6	2 5 4	2 3 5	7	"	Ecto dominant - Meso higher than Endo
19	4*	-	-	-	-	-	-	-	-	-
19	5	3 3 5	2 3 5	2 3 5	1 2 6	2 3 5	2 3 5	5	strong	Ecto dominant - Meso higher than Endo
19	6	3 3 5	3 3 5	3 3 5	3 3 5	3 3 5	3 3 5	1	"	Ecto dominant - Endo and Meso equal
20	1	3 5 3	2 4 4	2 4 4	2 4 4	2 4 4	2 4 4	4	"	No component dominant - Meso and Ecto equal (lower Endo)
20	2	2 5 3	2 4 4	2 5 4	2 4 4	2 5 4	2 5 4	4	"	Meso dominant - Ecto higher than Endo
20	3*	2 4 5	2 4 5	1 4 5	1 3 6	2 4 5	2 4 5	5	"	Ecto dominant - Meso higher than Endo
20	4	2 6 1	2 6 1	2 6 1	2 6 1	2 7 1	2 6 1	2	"	Meso dominant - Endo higher than Ecto
20	5	2 5 3	1 5 4	2 5 4	1 5 4	3 5 3	2 5 4	5	"	Meso dominant - Ecto higher than Endo
20	6	3 6 2	3 6 2	3 6 2	3 6 1	3 6 2	3 6 2	2	"	Meso dominant - Endo higher than Ecto

* Subject not included in analysis.

- Indicates no data.

‡ Endo = Endomorphy.
Meso = Mesomorphy.
Ecto = Ectomorphy.

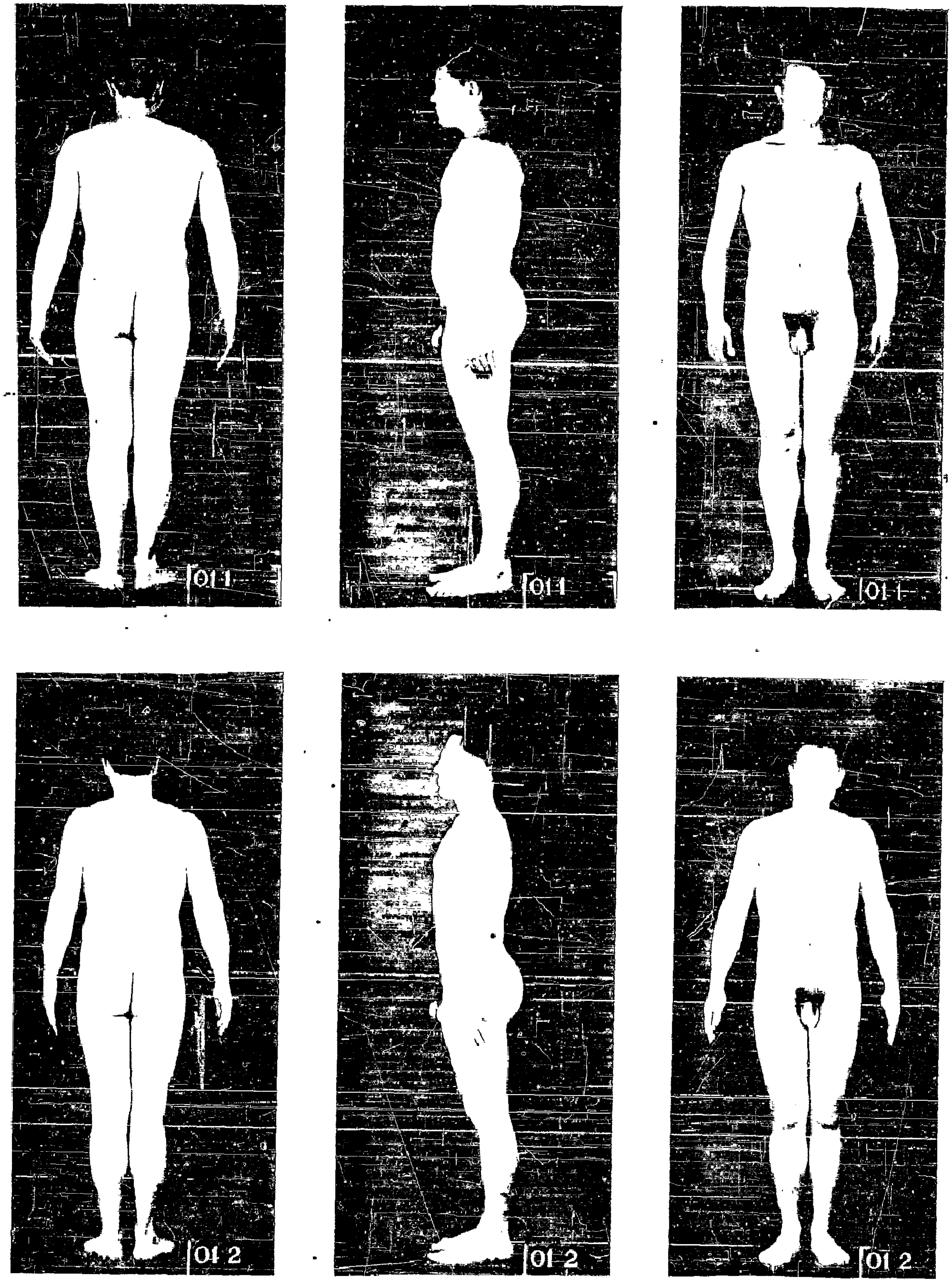


Figure F-5. Group 01 (subjects 1 and 2)

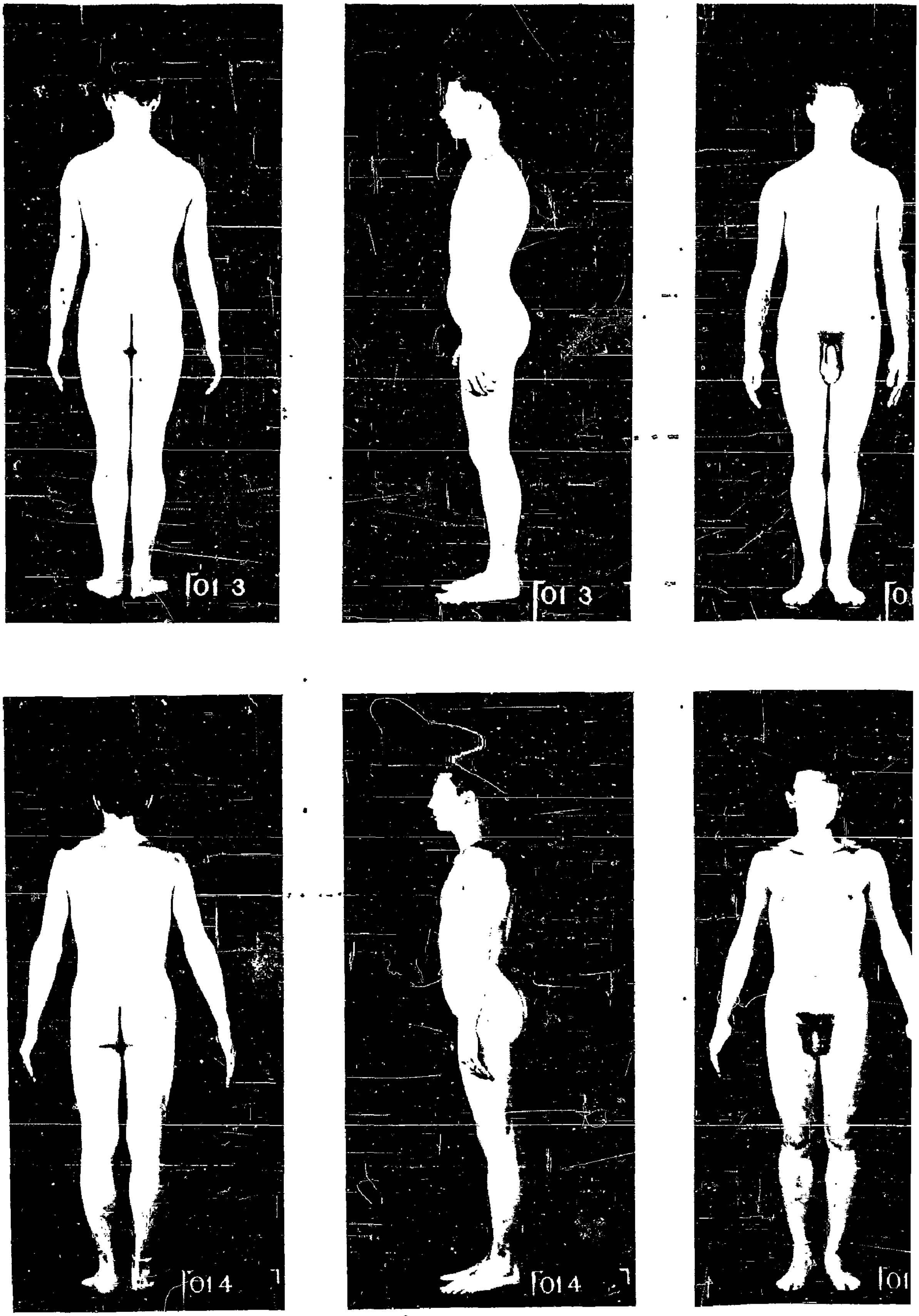


Figure F-5. Group 01 (subjects 3 and 4)

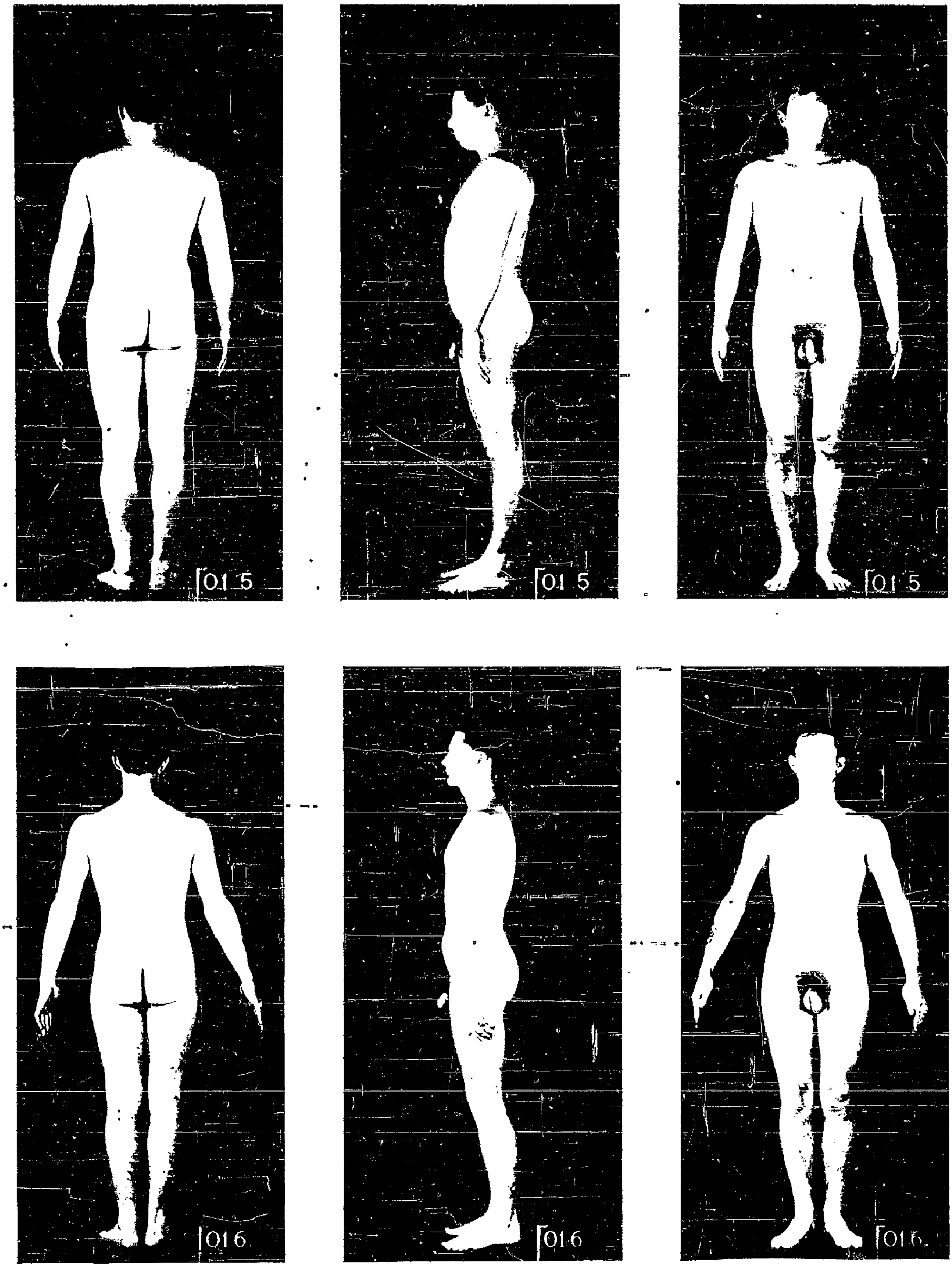


Figure F-5. Group 01 (subjects 5 and 6)

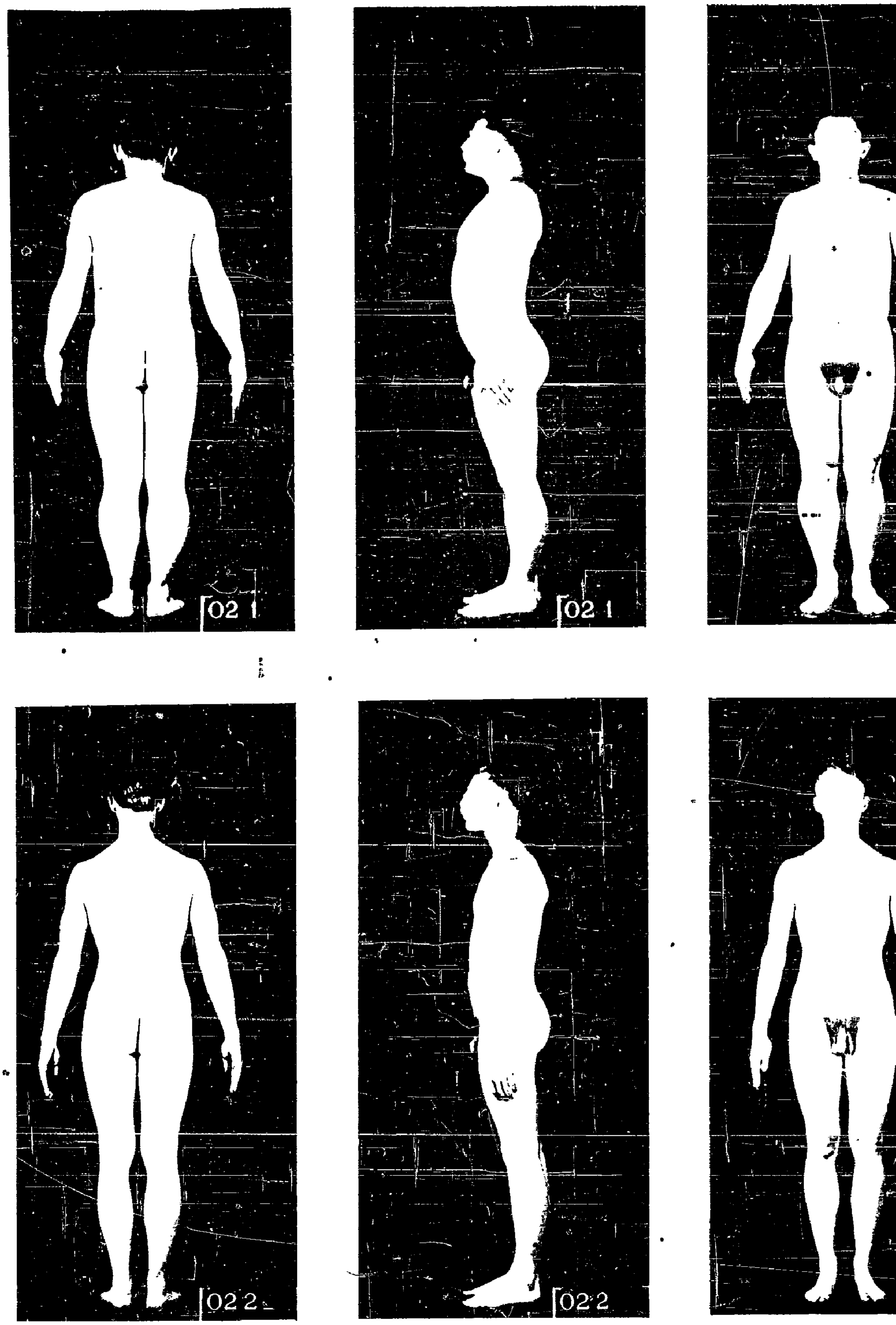


Figure F-6. Group 02 (subjects 1 and 2)

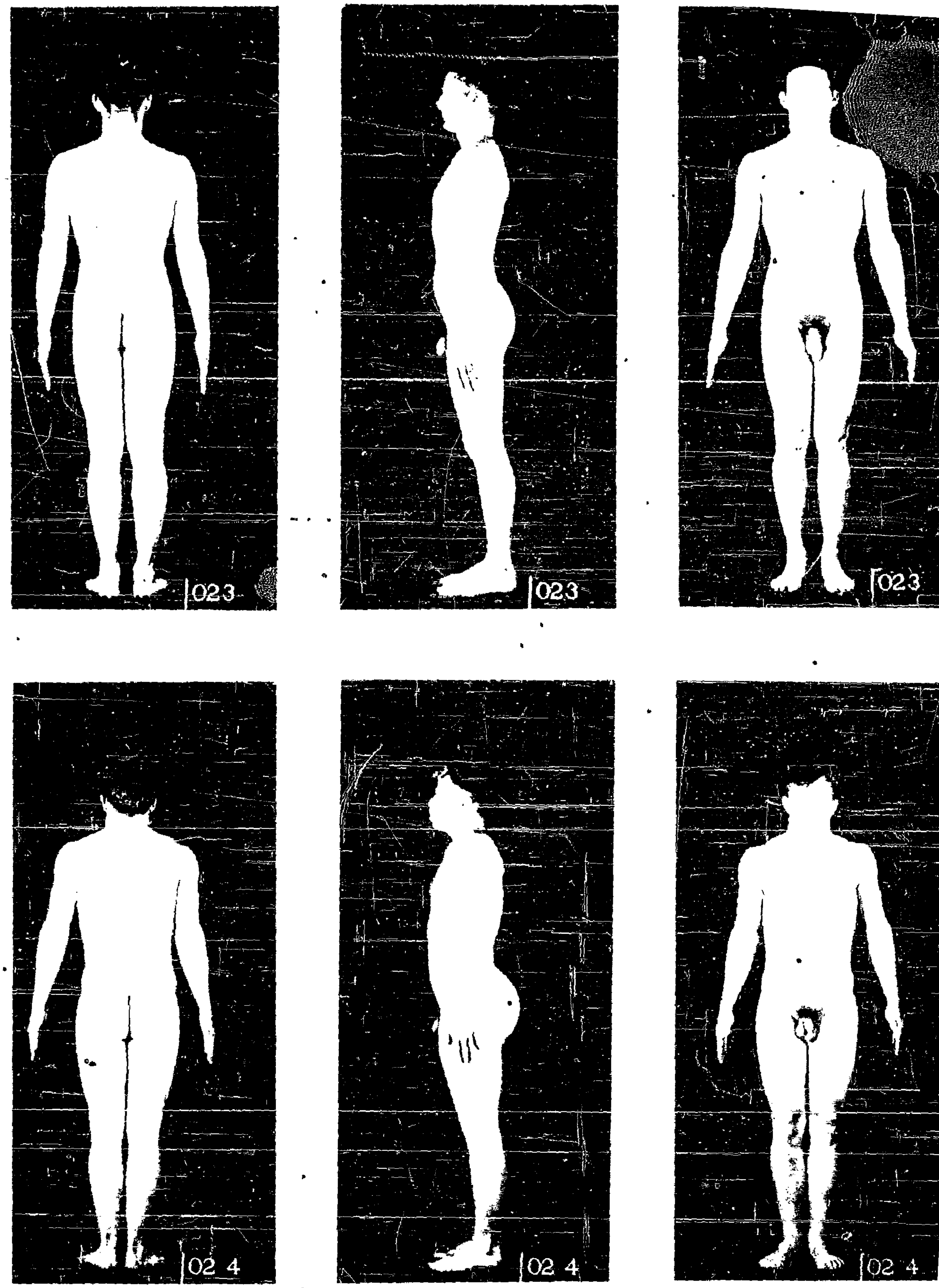


Figure F-6. Group 02 (subjects 3 and 4)

(Subject 5, Group 02 - photograph not available)

Figure F-6. Group 02 (subject 6)

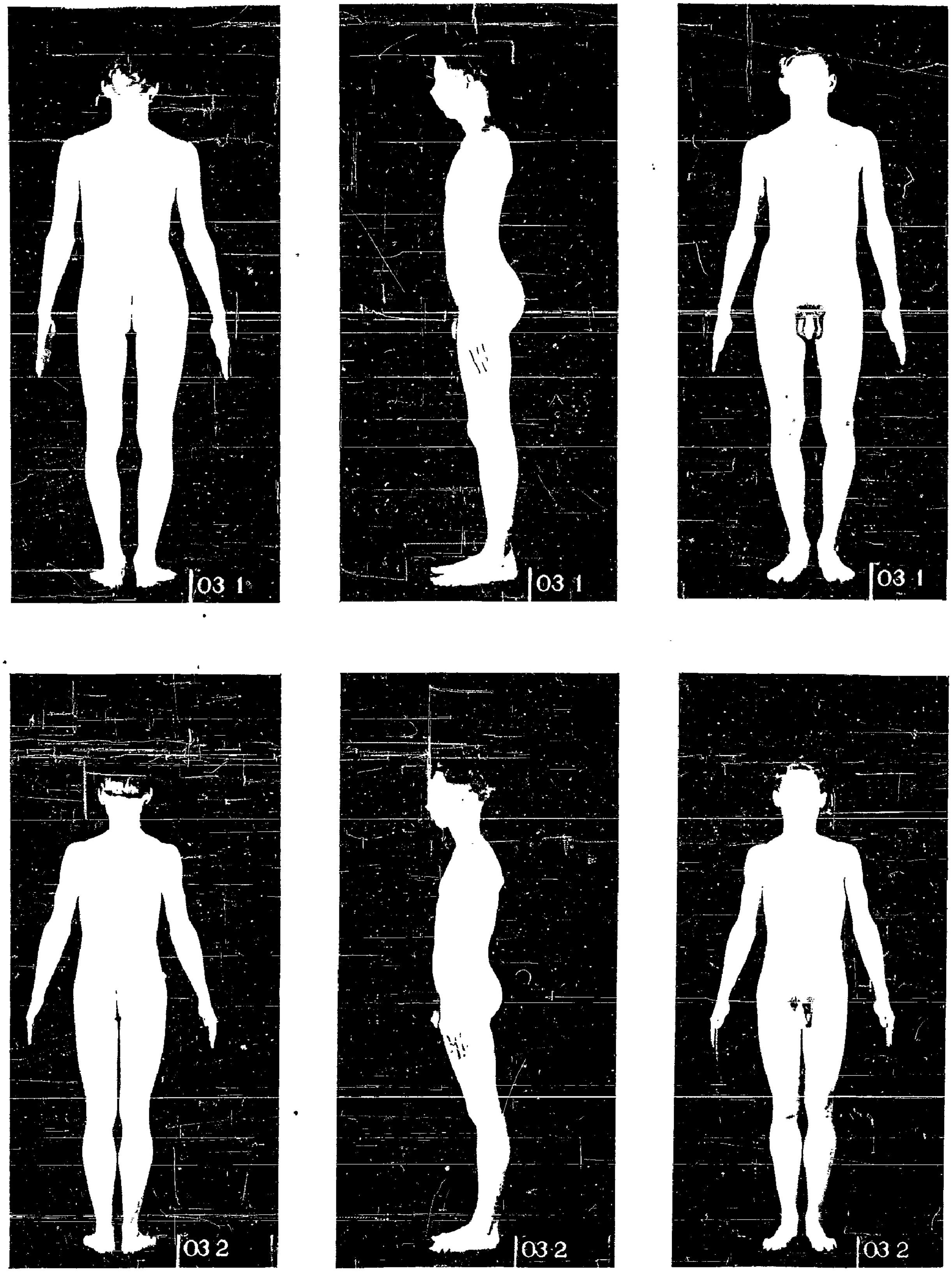


Figure F-7. Group 03 (subjects 1 and 2)

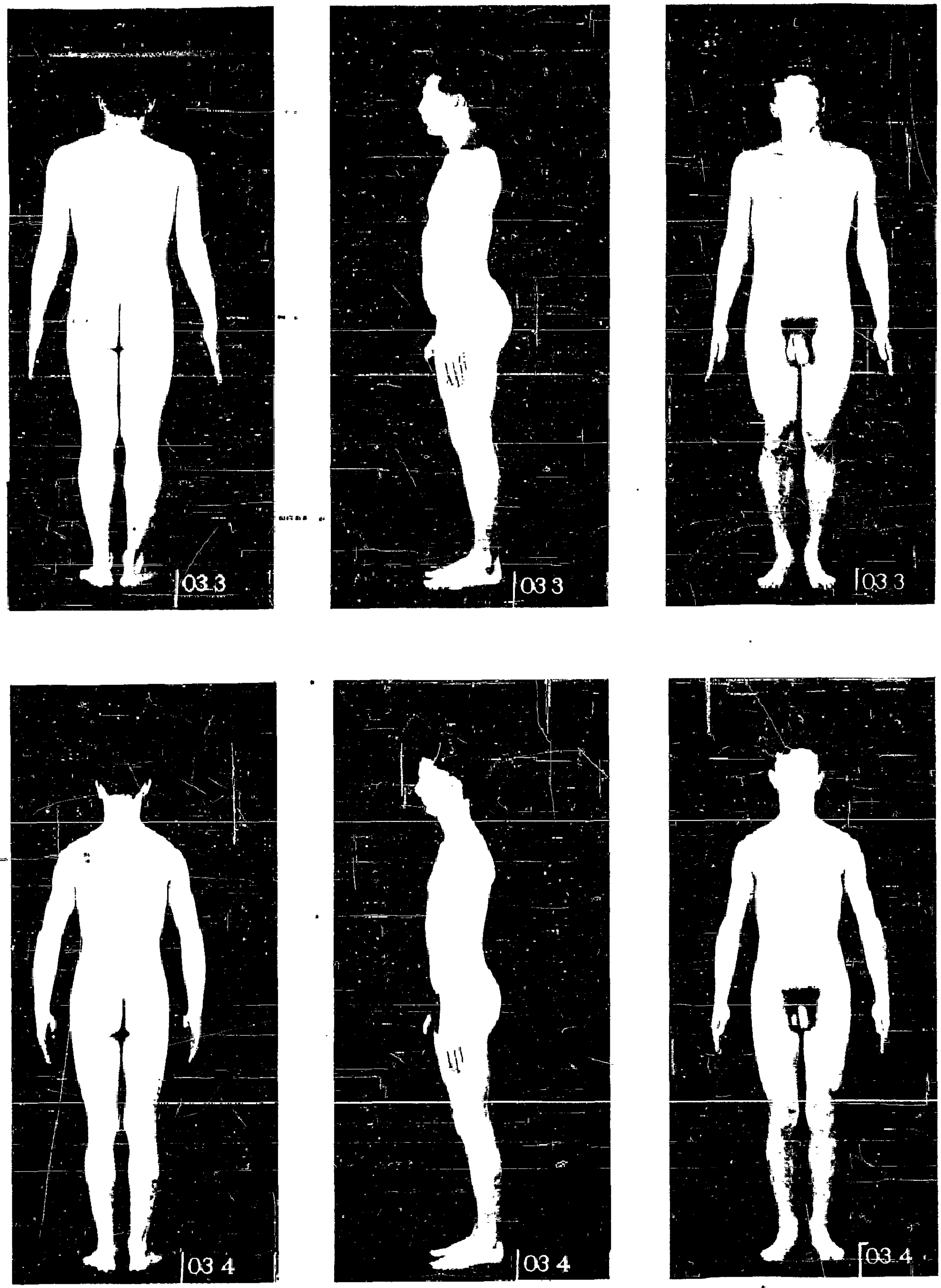


Figure F-7. Group 03 (subjects 3 and 4)

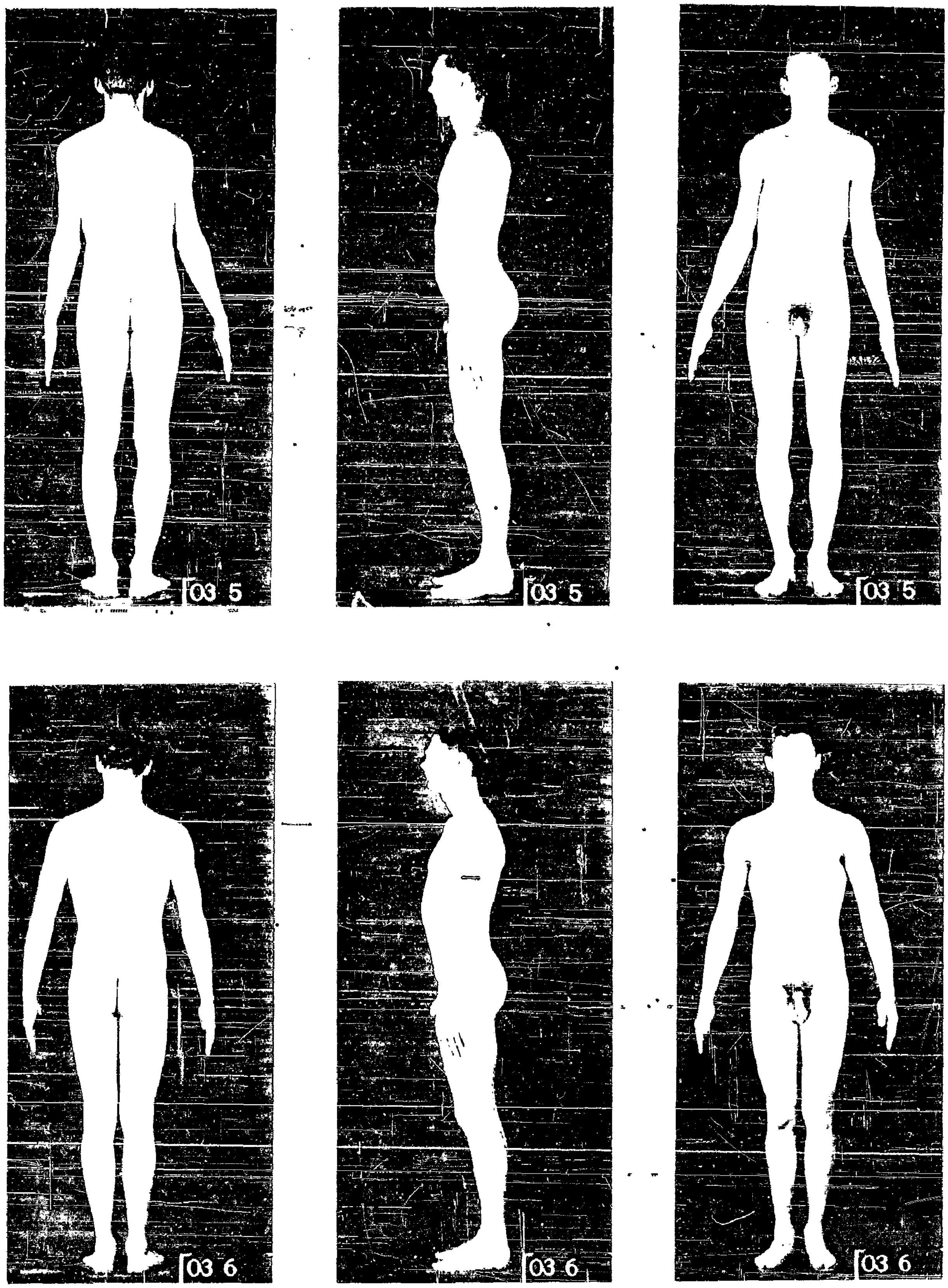


Figure F-7. Group 03 (subjects 5 and 6)

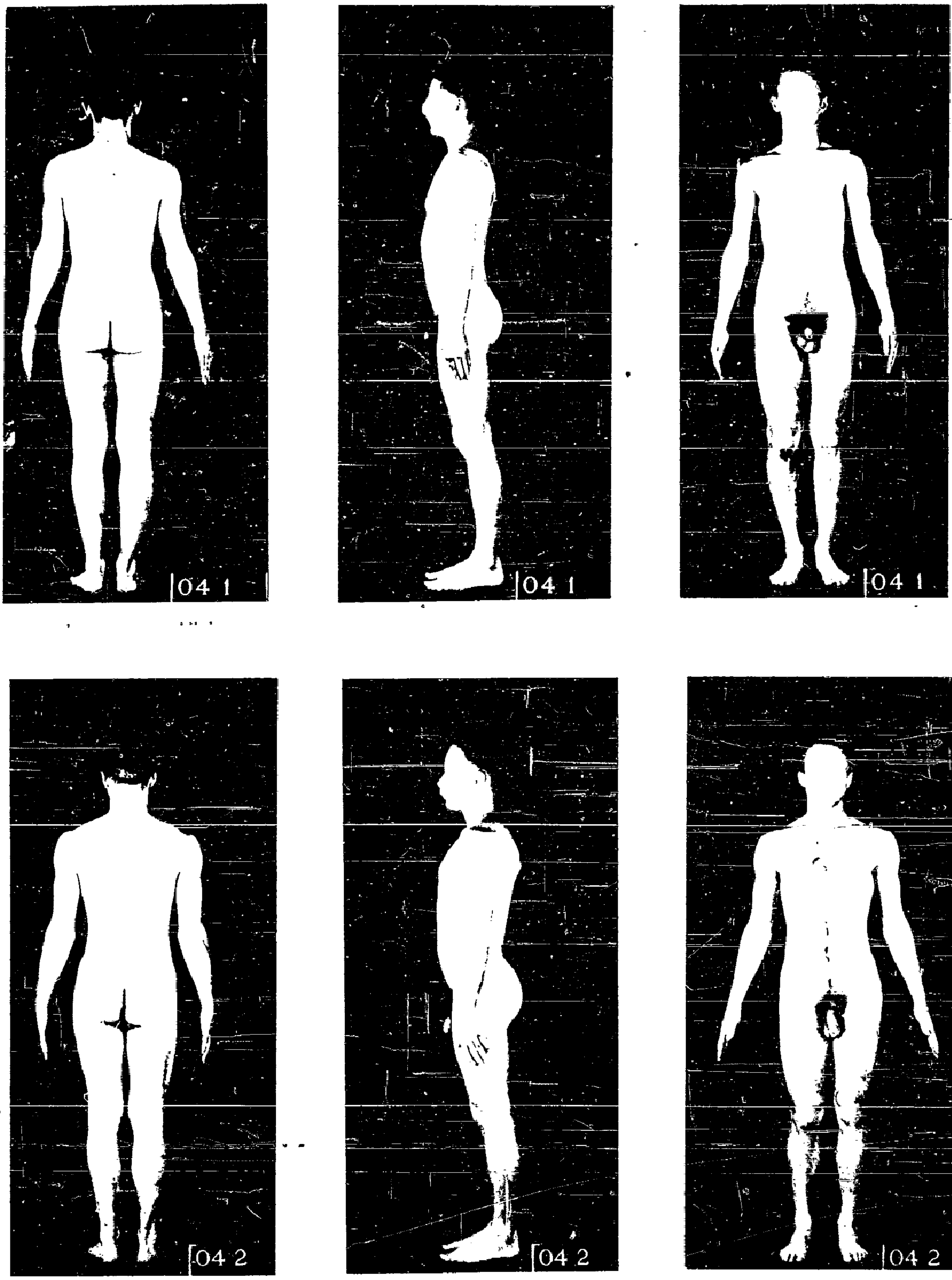


Figure F-8. Group 04 (subjects 1 and 2)

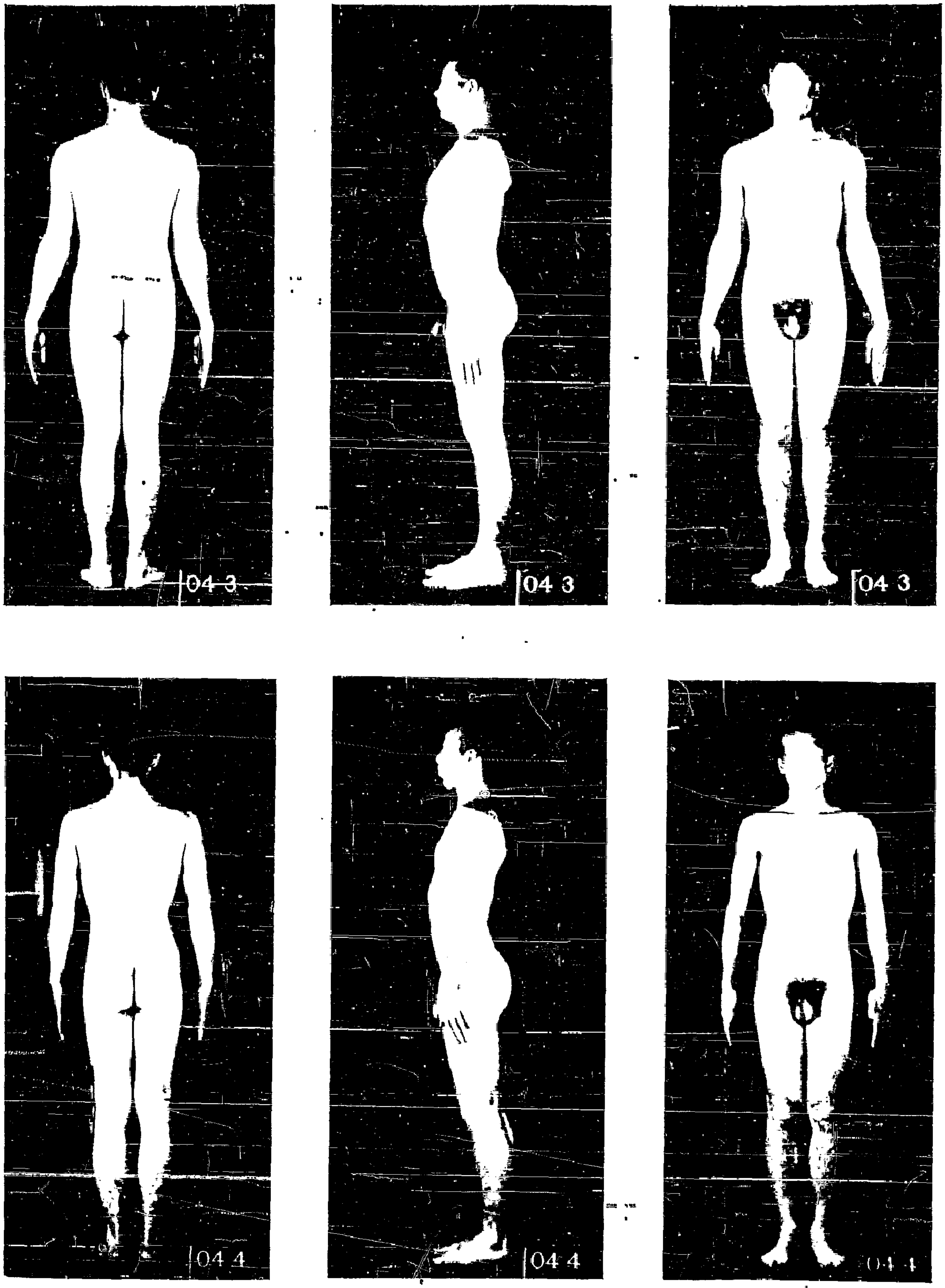


Figure F-8. Group 04 (subjects 3 and 4)

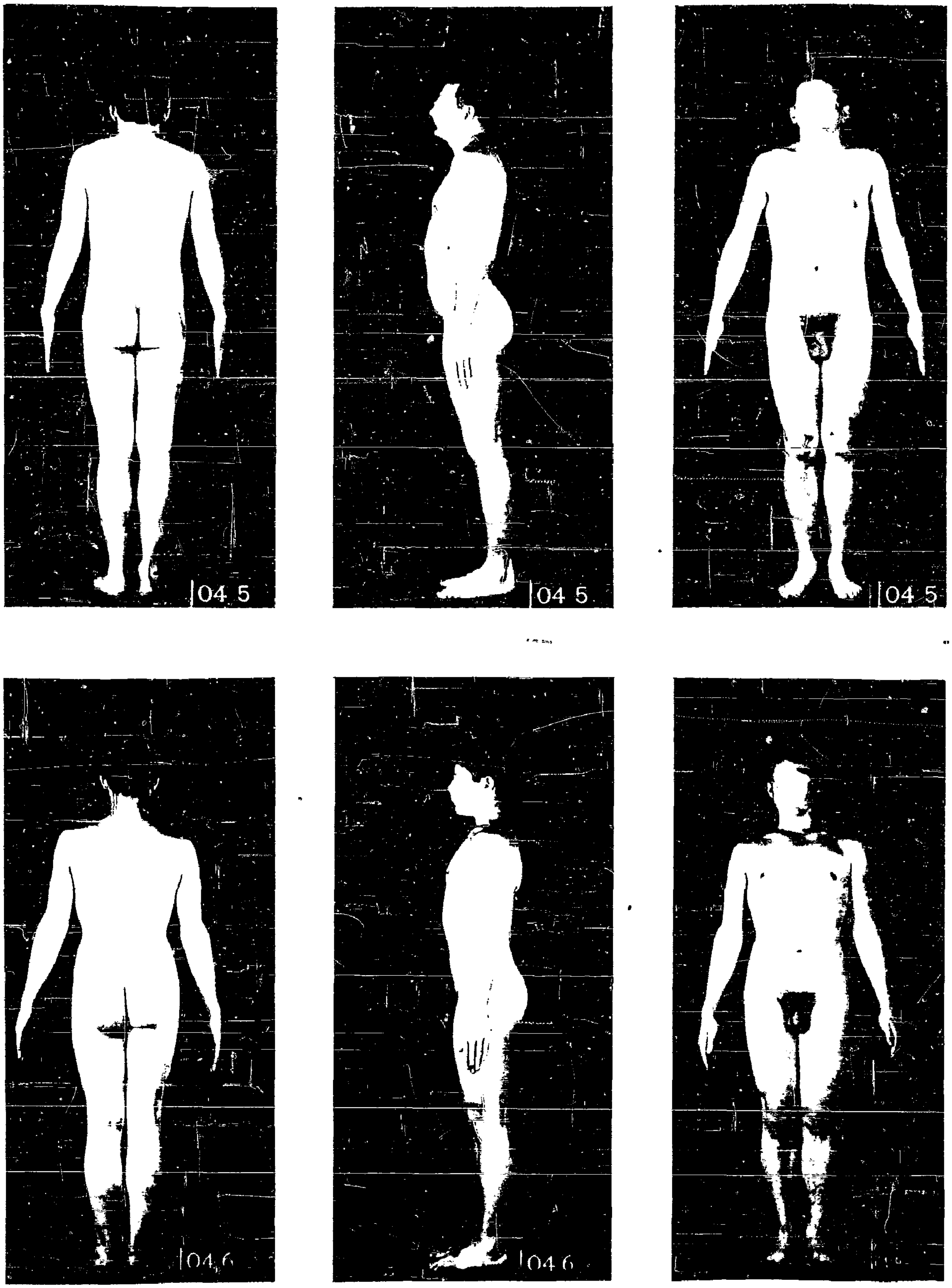


Figure F-8. Group 04 (subjects 5 and 6)

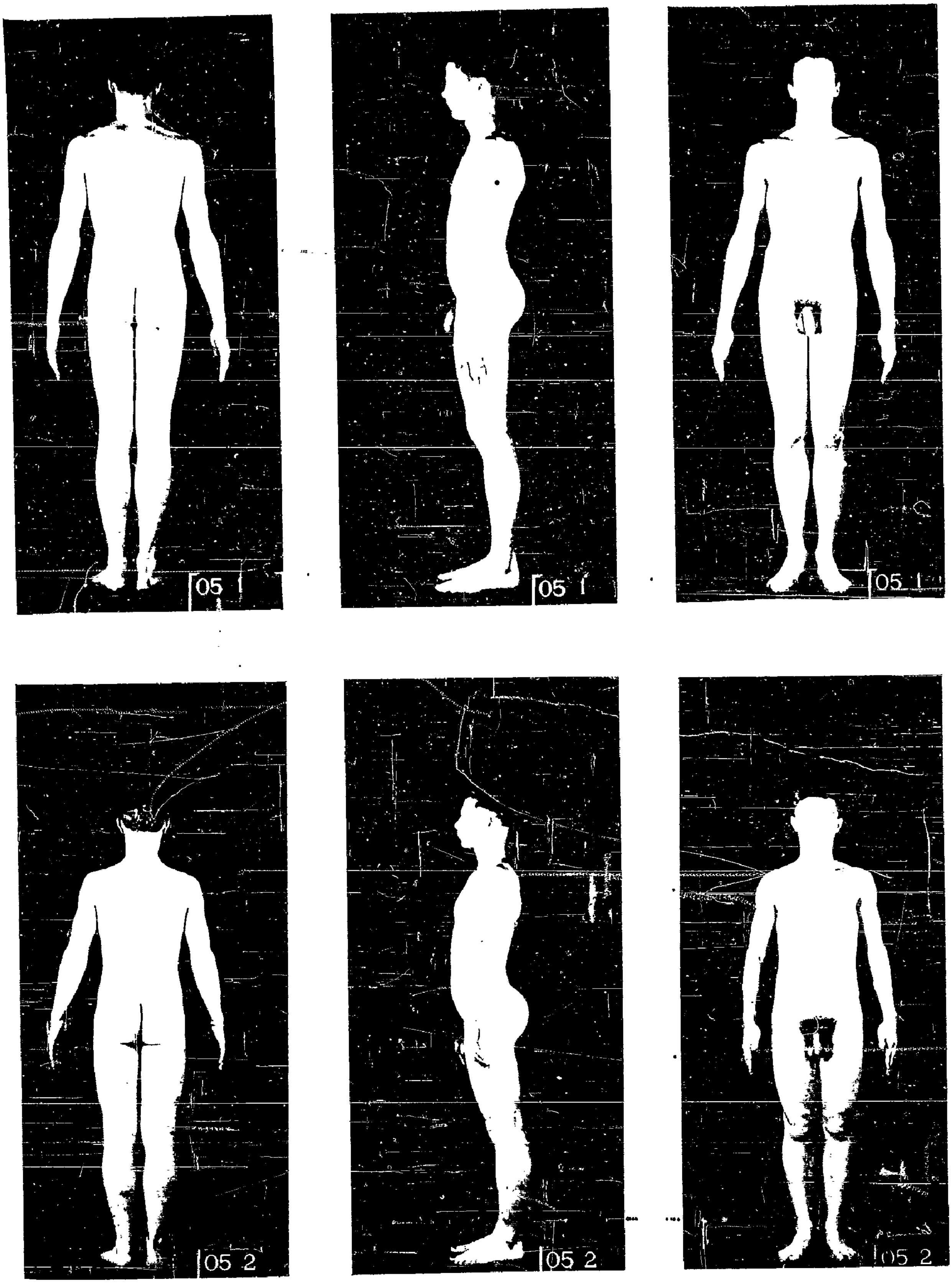


Figure F-9. Group 05 (subjects 1 and 2)

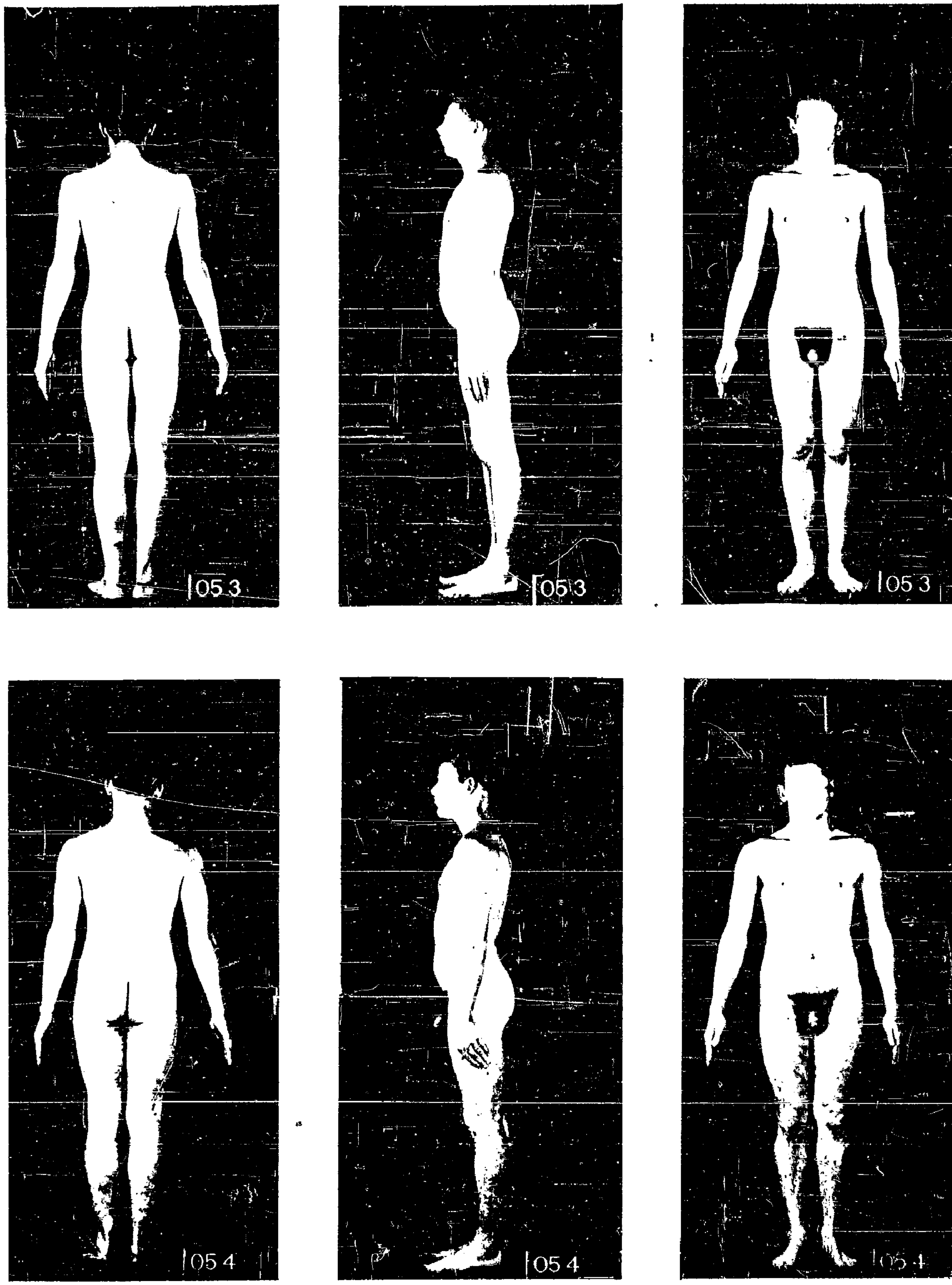


Figure F-9. Group 05 (subjects 3 and 4)

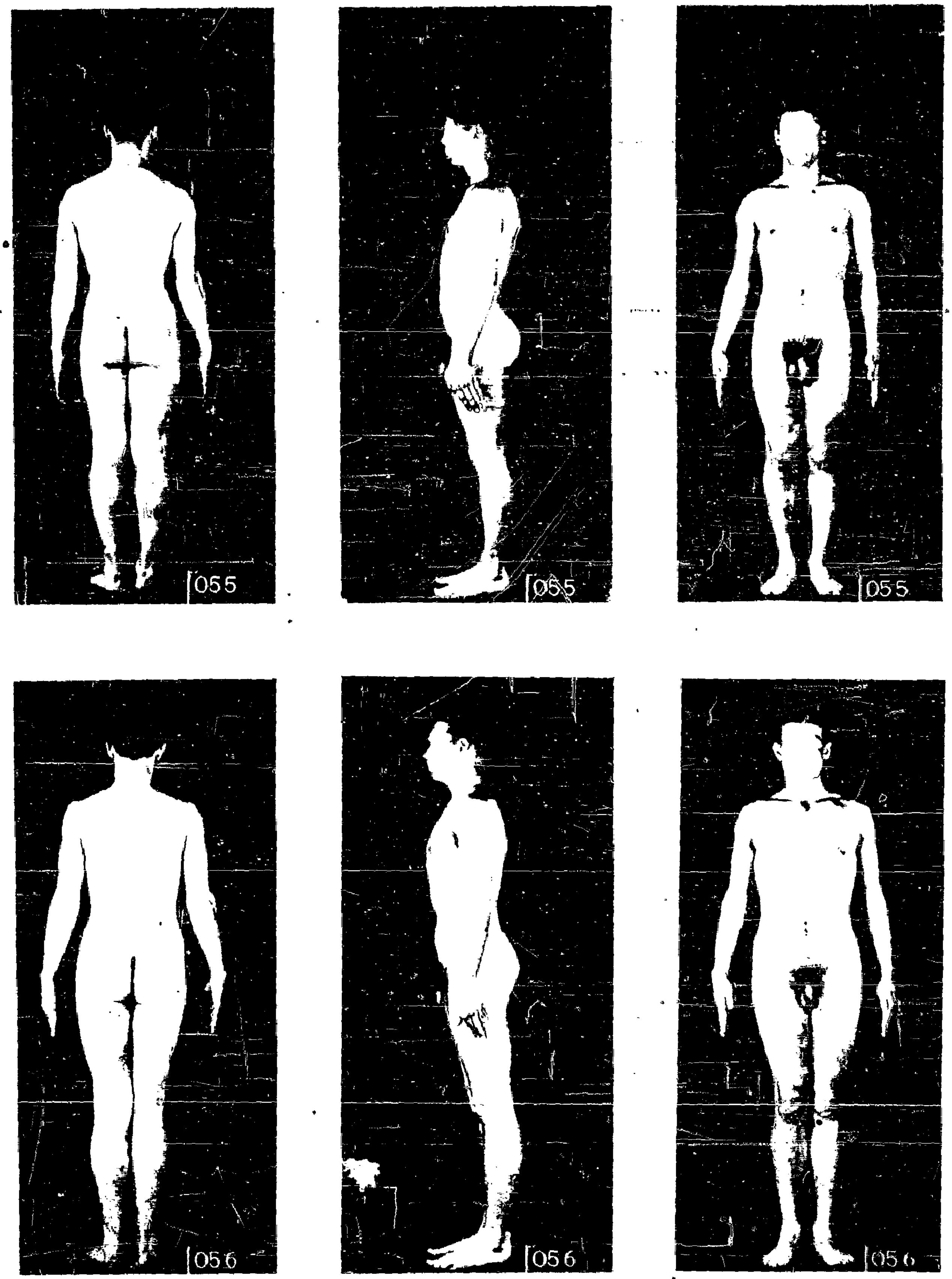


Figure F-9. Group 05 (subjects 5 and 6)

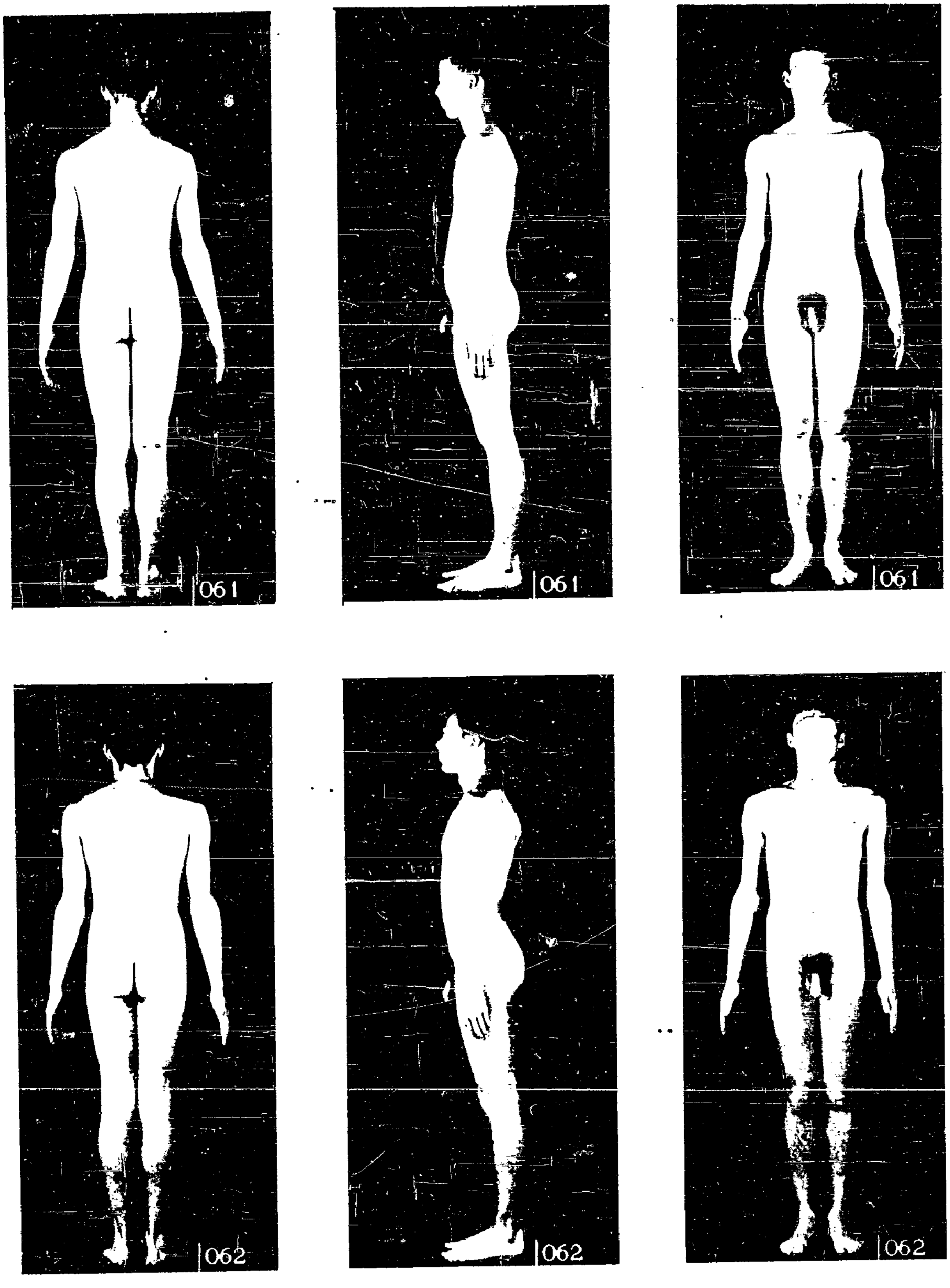


Figure F-10. Group 06 (subjects 1 and 2)

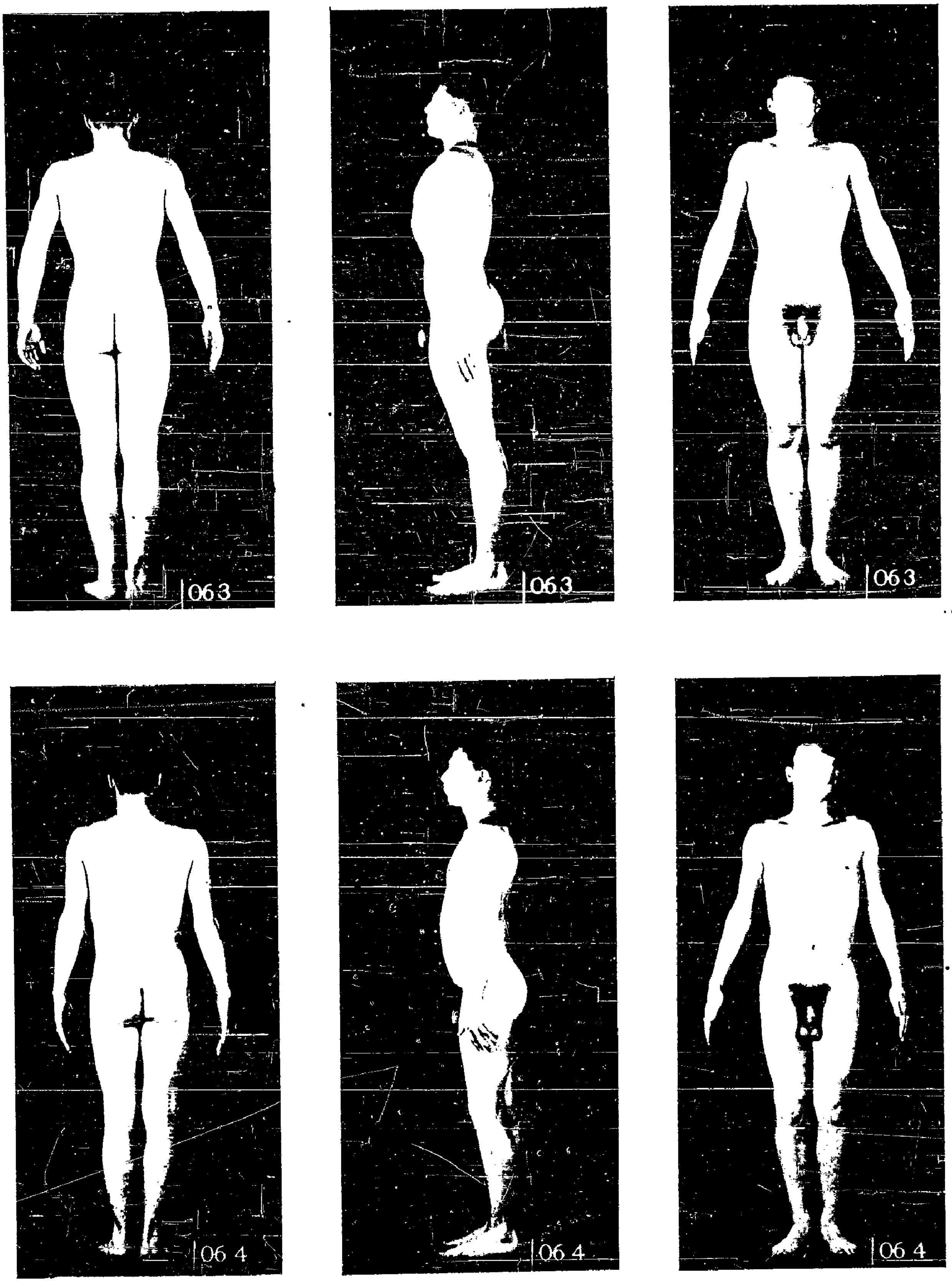


Figure F-10. Group 06 (subjects 3 and 4)

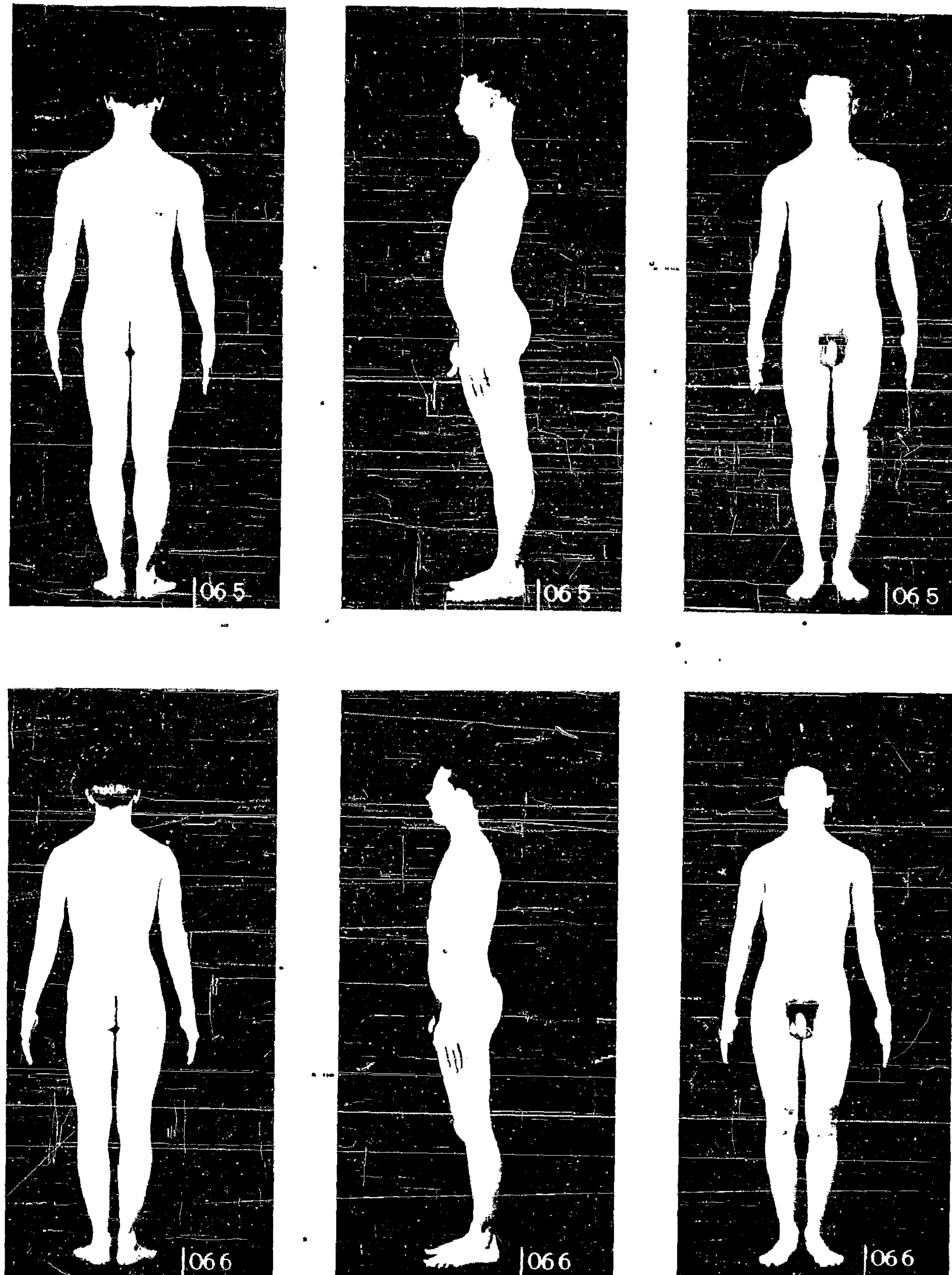


Figure F-10. Group 06 (subjects 5 and 6)

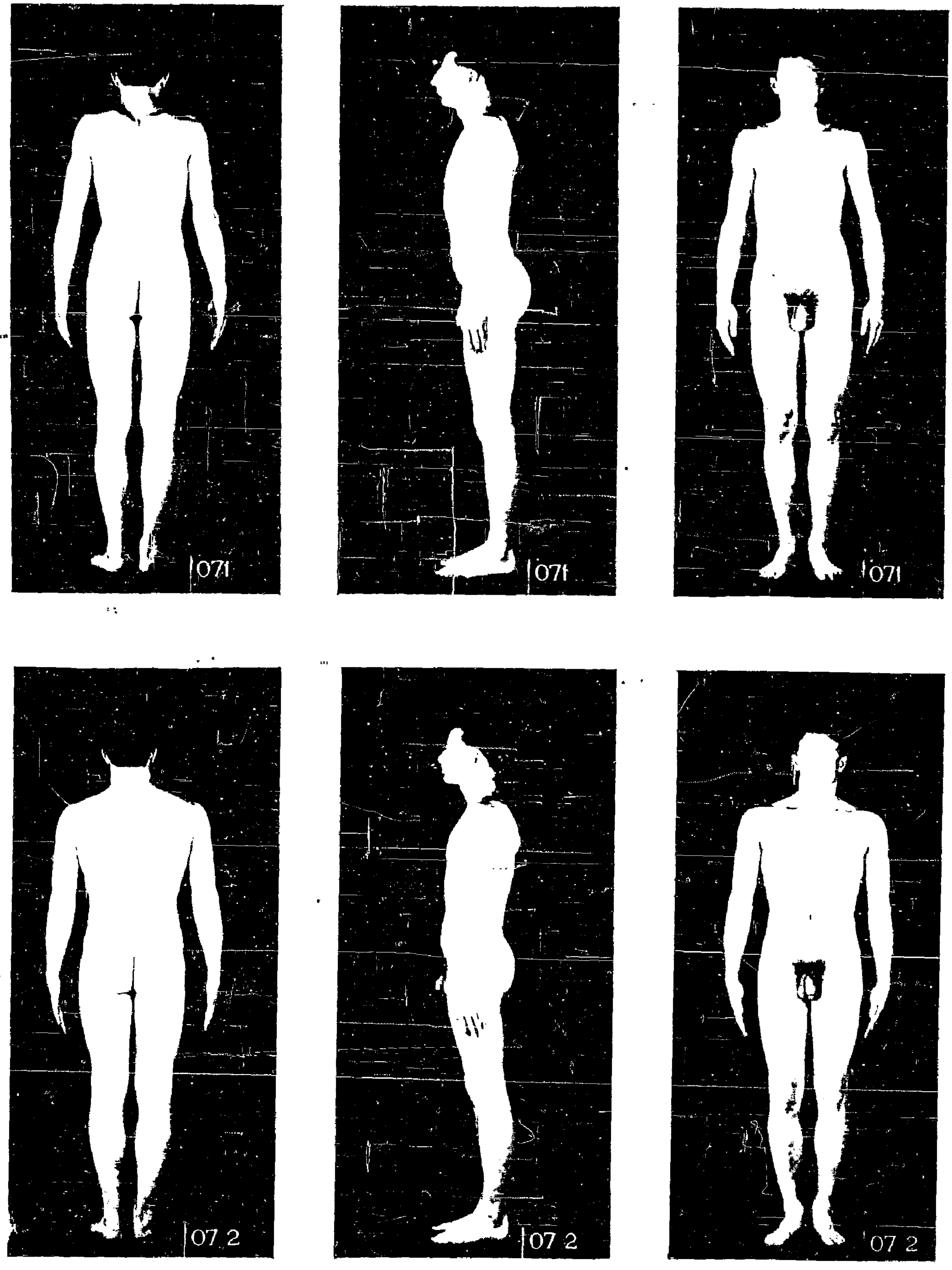


Figure F-11. Group 07 (subjects 1 and 2)

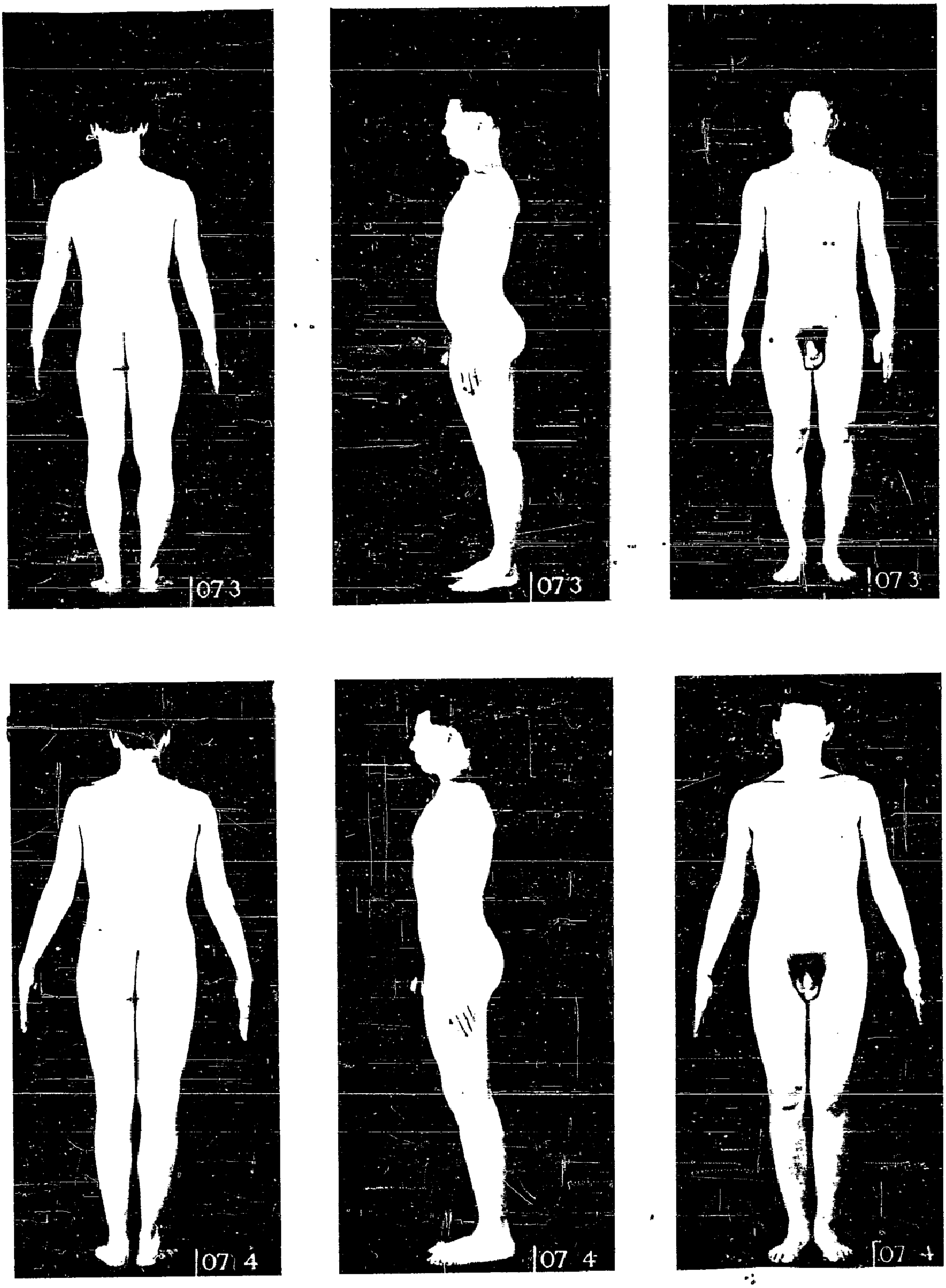


Figure F-11. Group 07 (subjects 3 and 4)

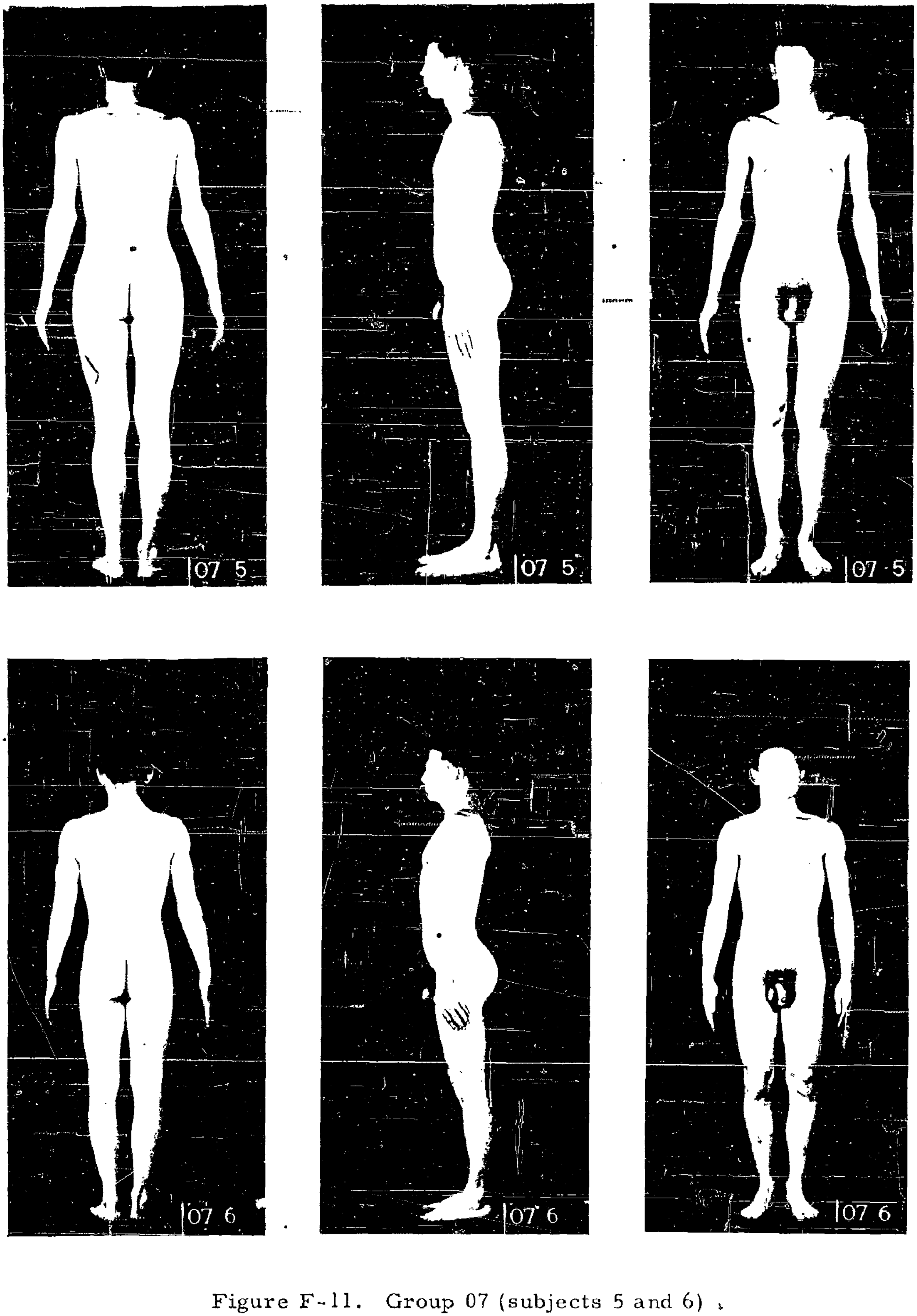


Figure F-11. Group 07 (subjects 5 and 6)

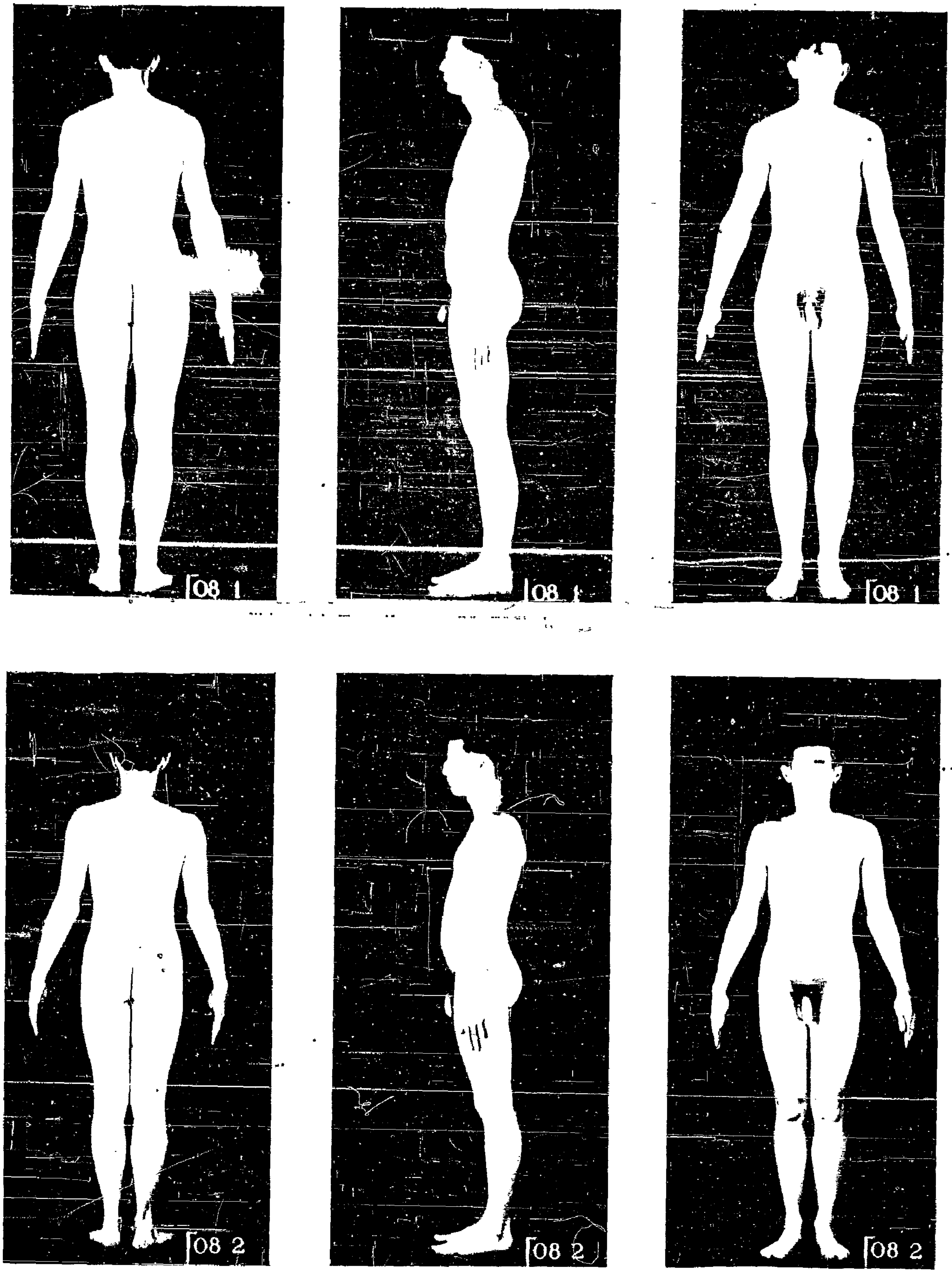


Figure F-12. Group 08 (subjects 1 and 2)

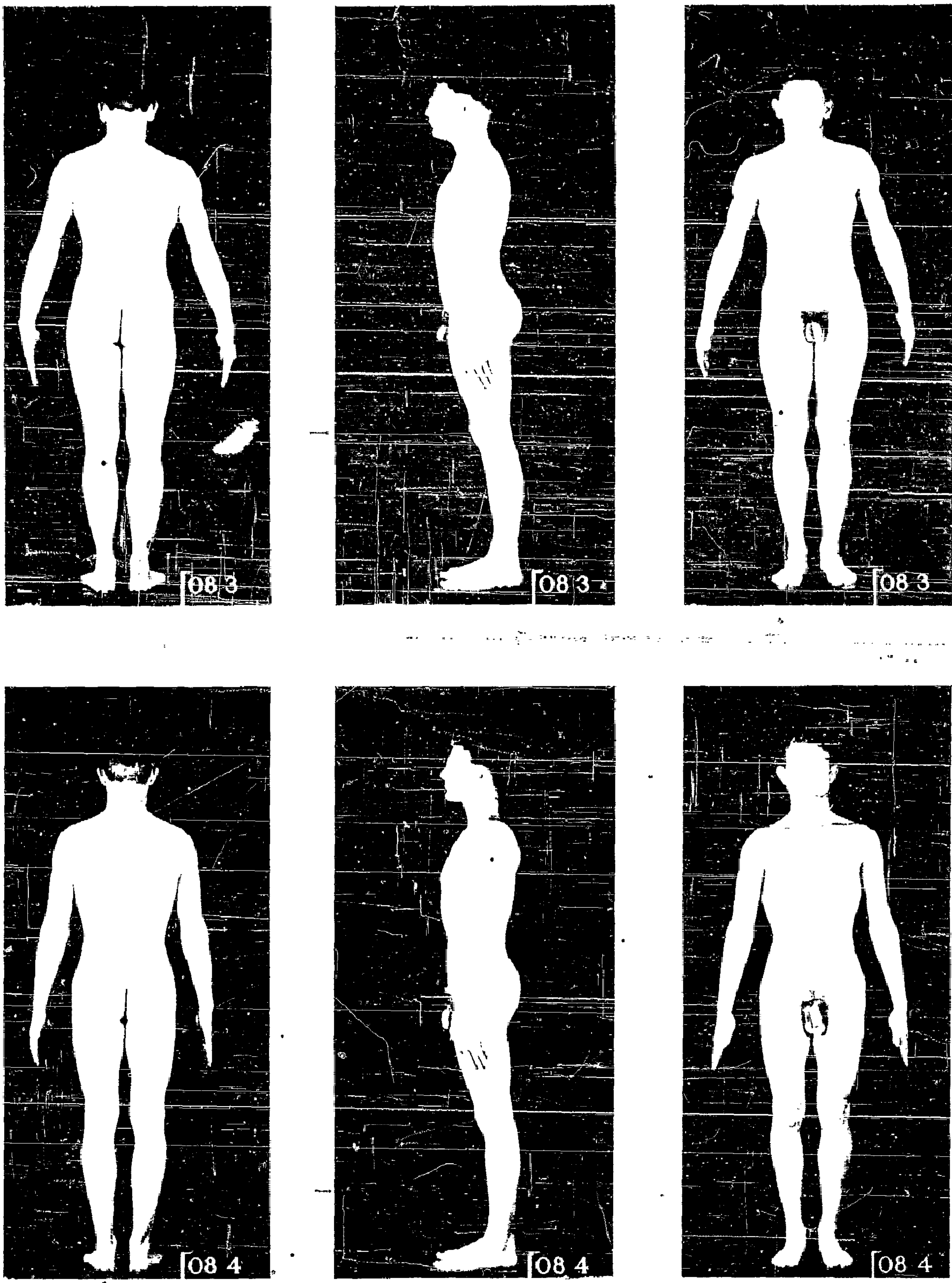


Figure F-12. Group 08 (subjects 3 and 4)

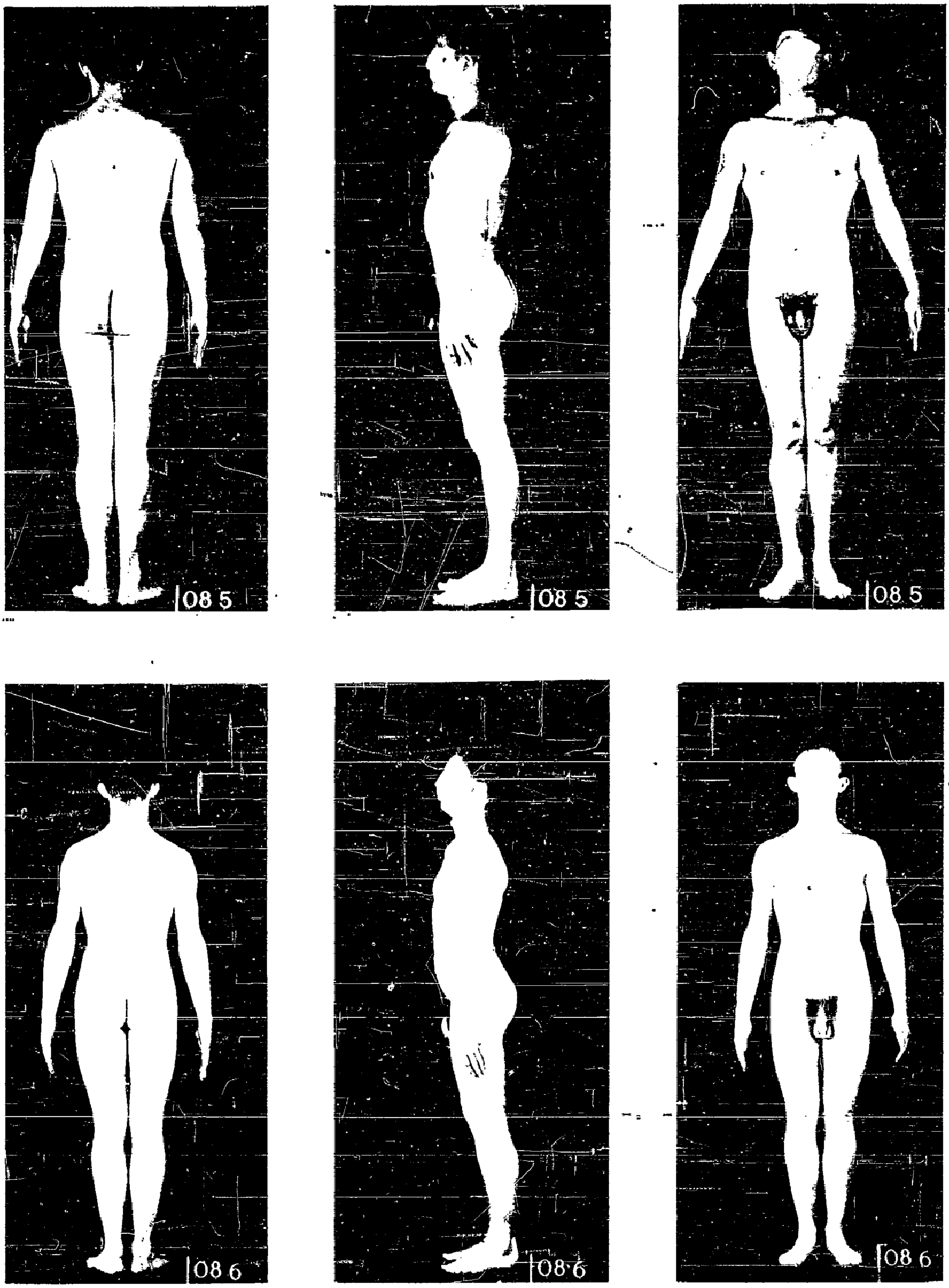


Figure F-12. Group 08 (subjects 5 and 6)

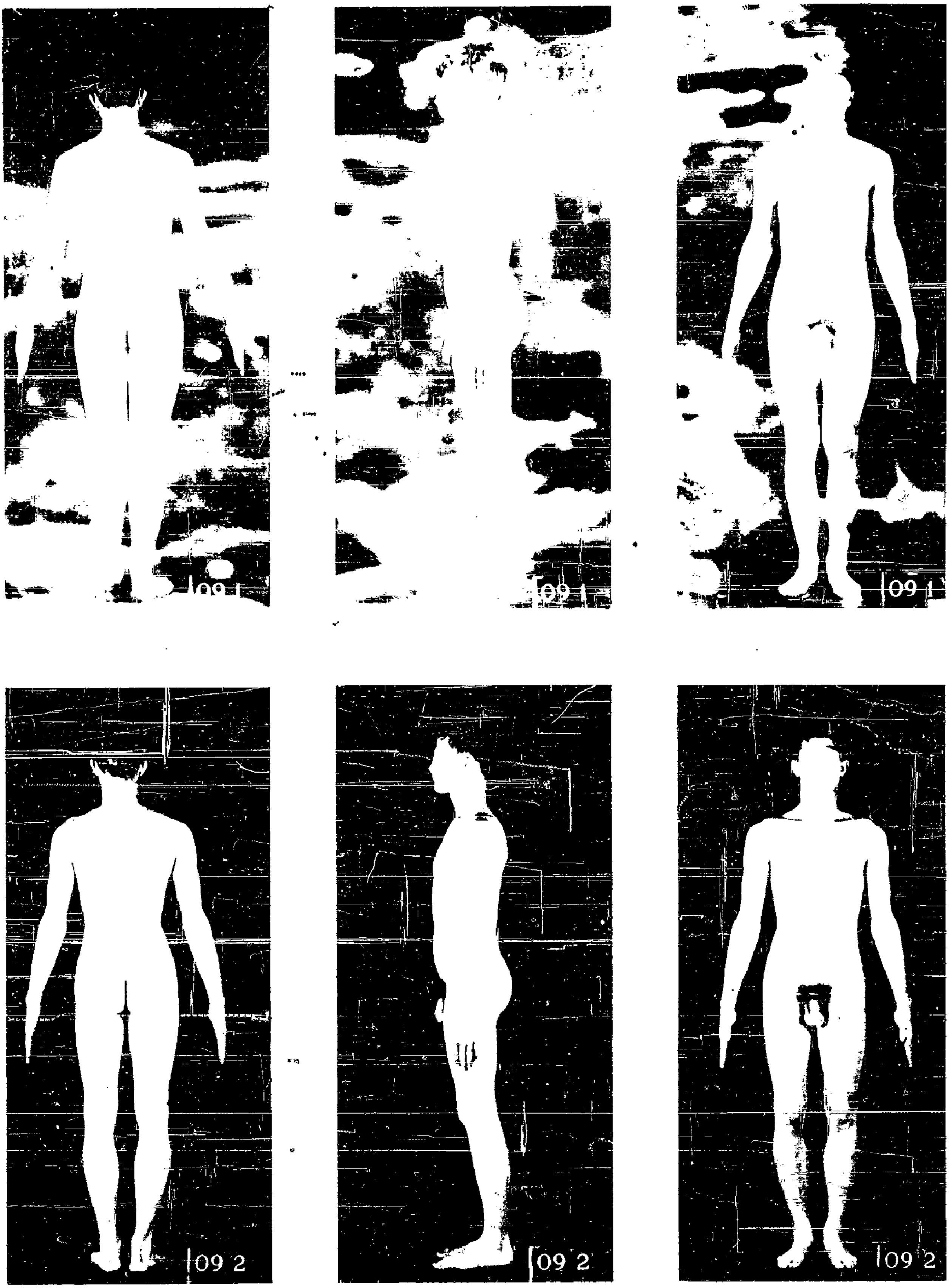


Figure F-13. Group 09 (subjects 1 and 2)

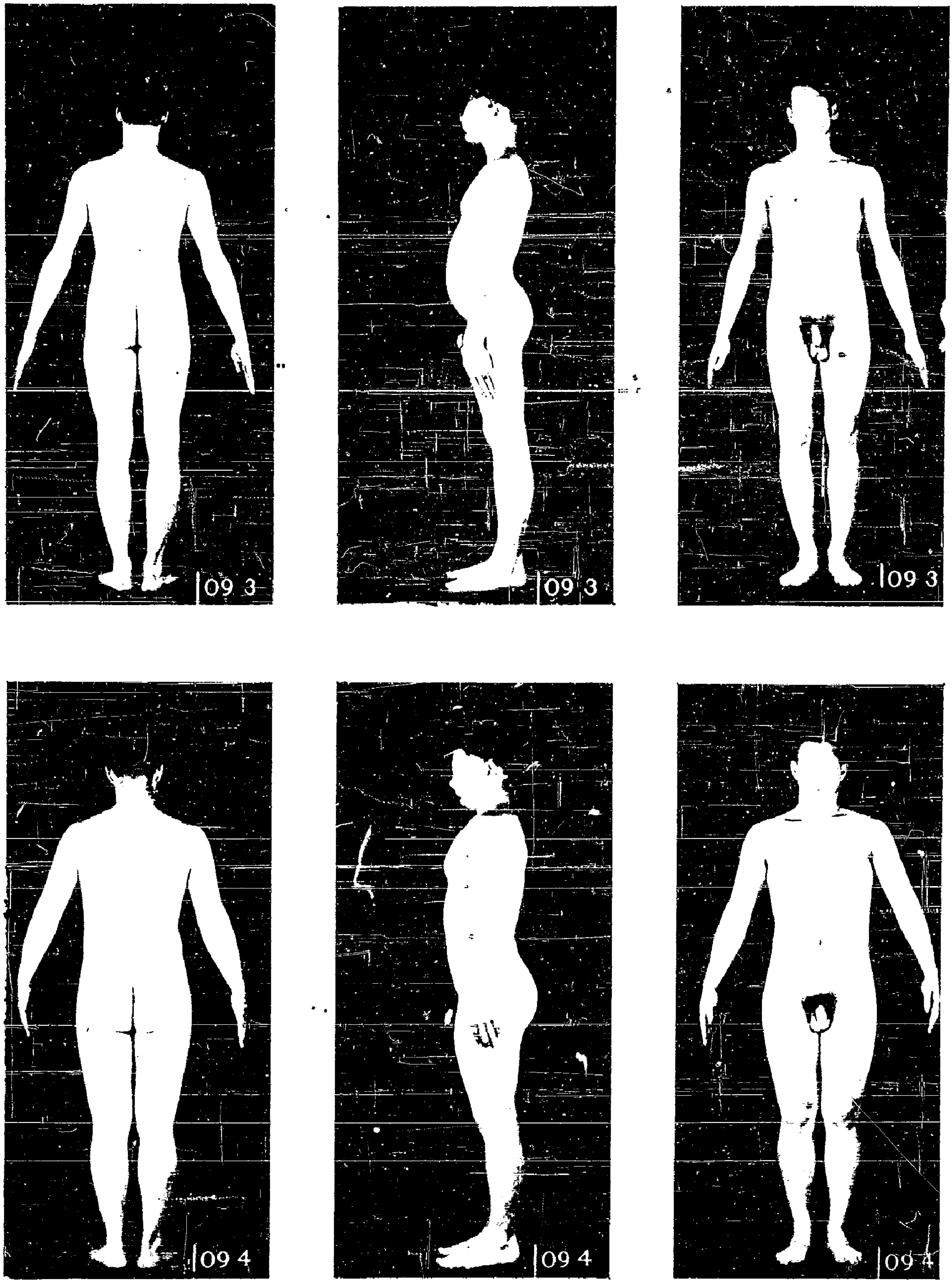


Figure F-13. Group 09 (subjects 3 and 4)

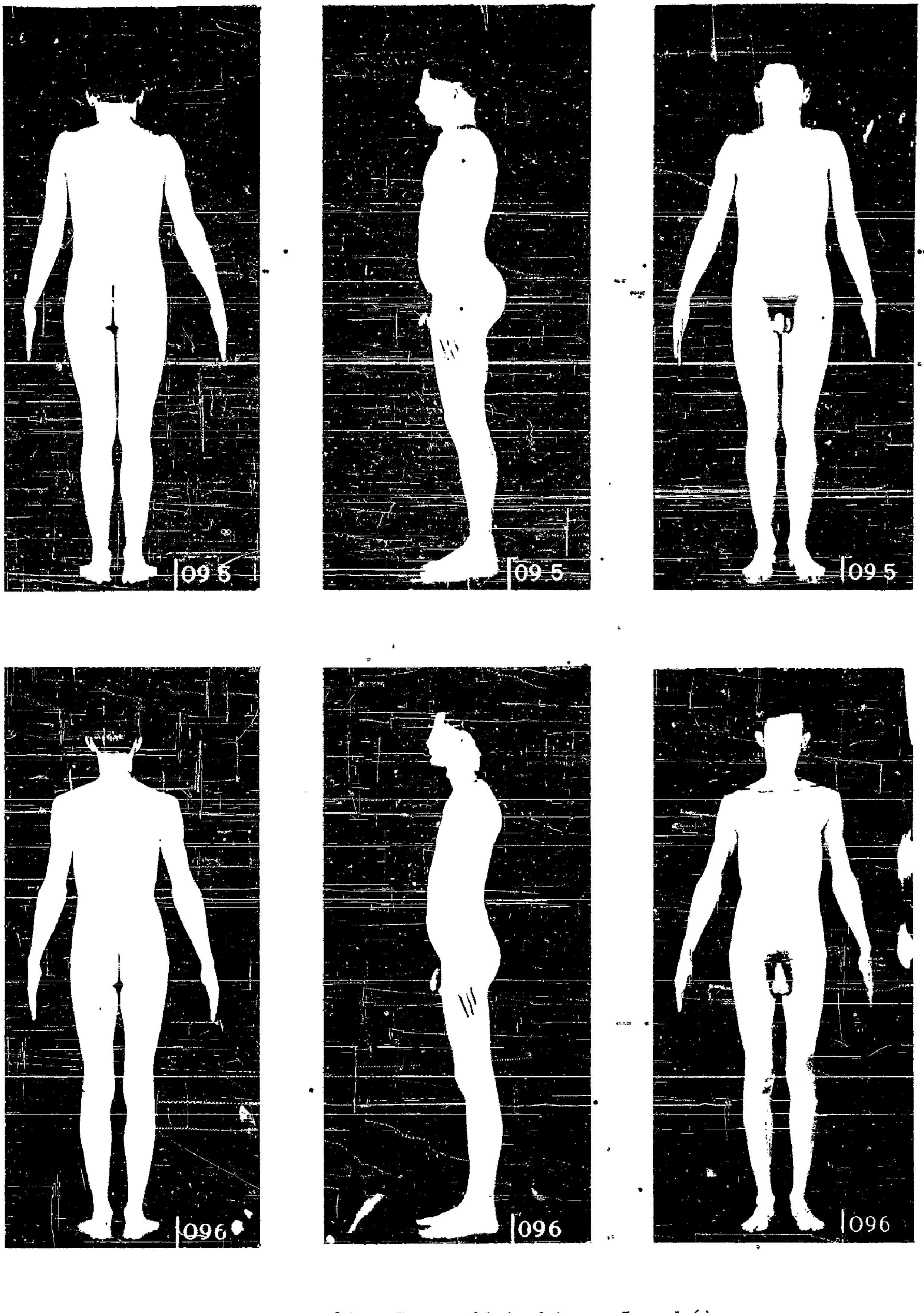


Figure F-13. Group 09 (subjects 5 and 6)

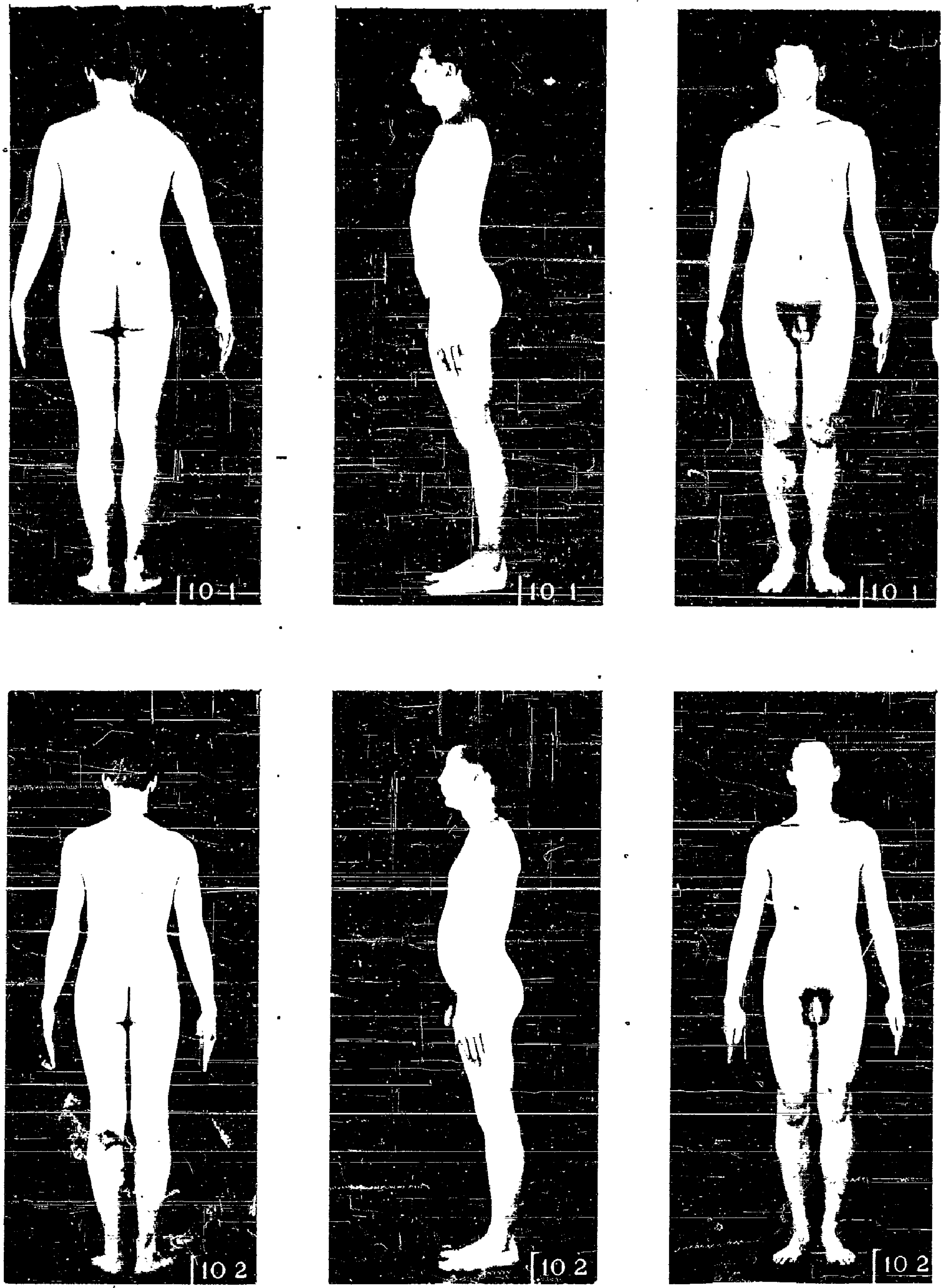


Figure F-14. Group 10 (subjects 1 and 2)

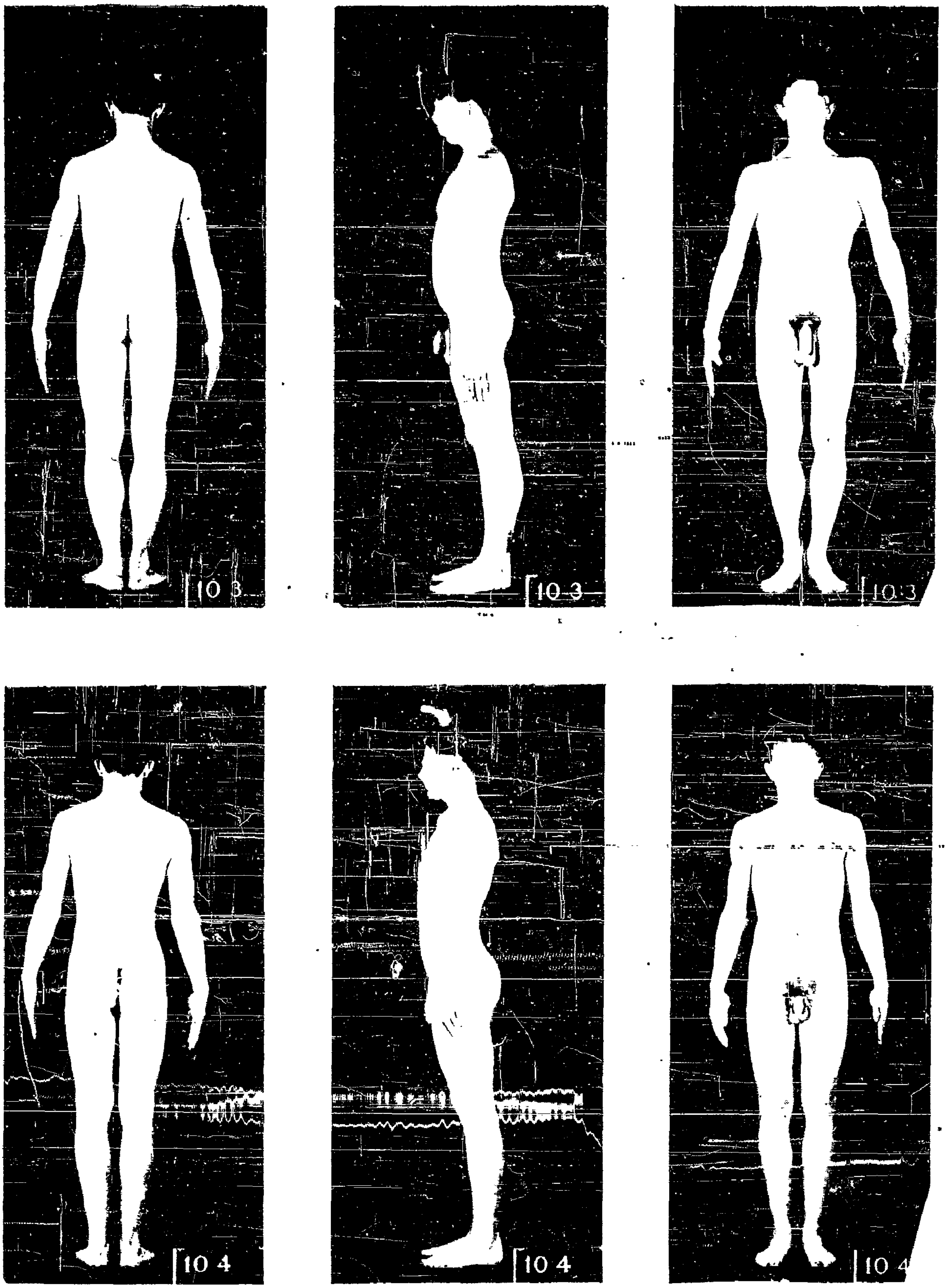


Figure F-14. Group 10 (subjects 3 and 4)

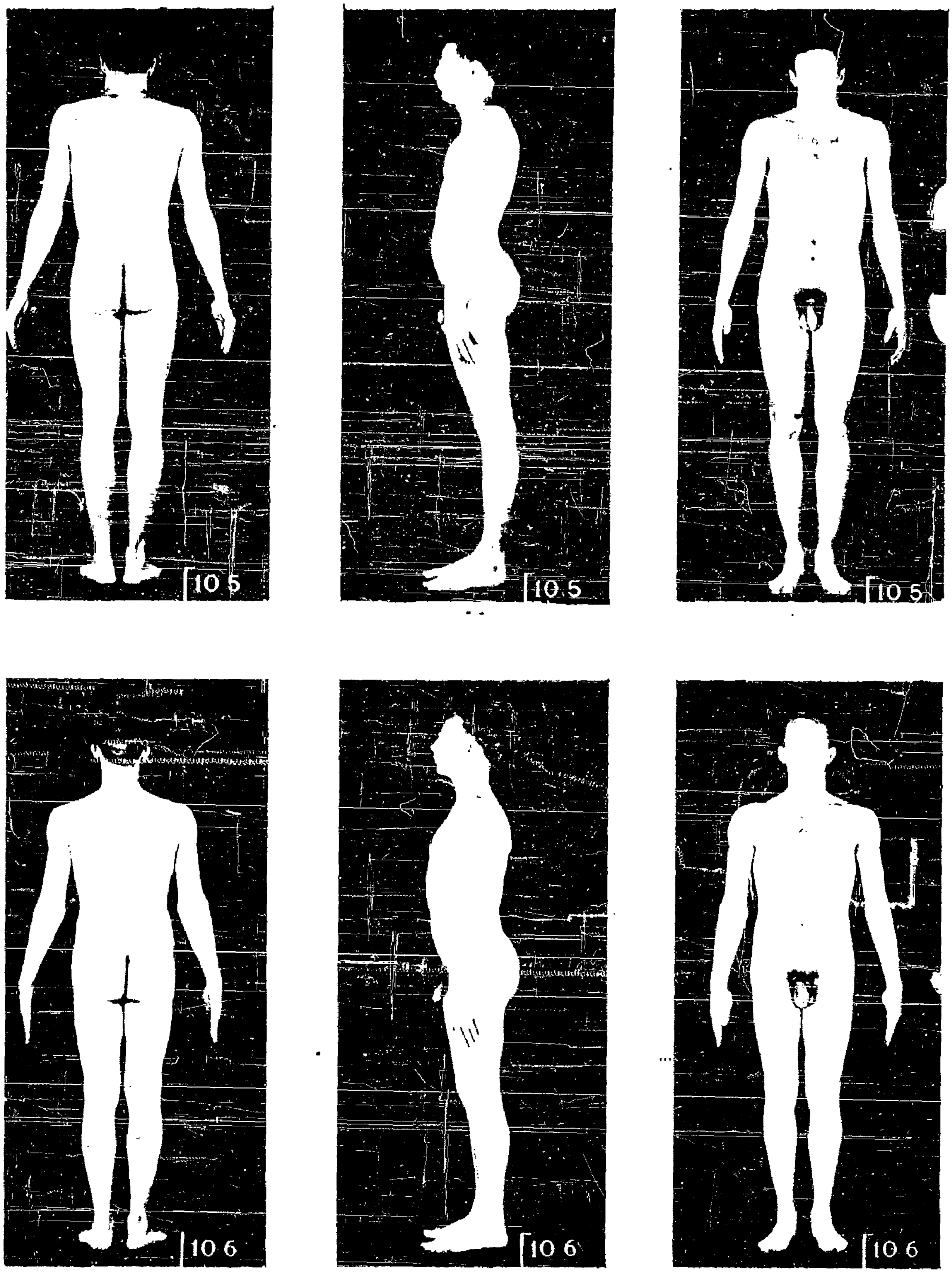


Figure F-14. Group 10 (subjects 5 and 6)

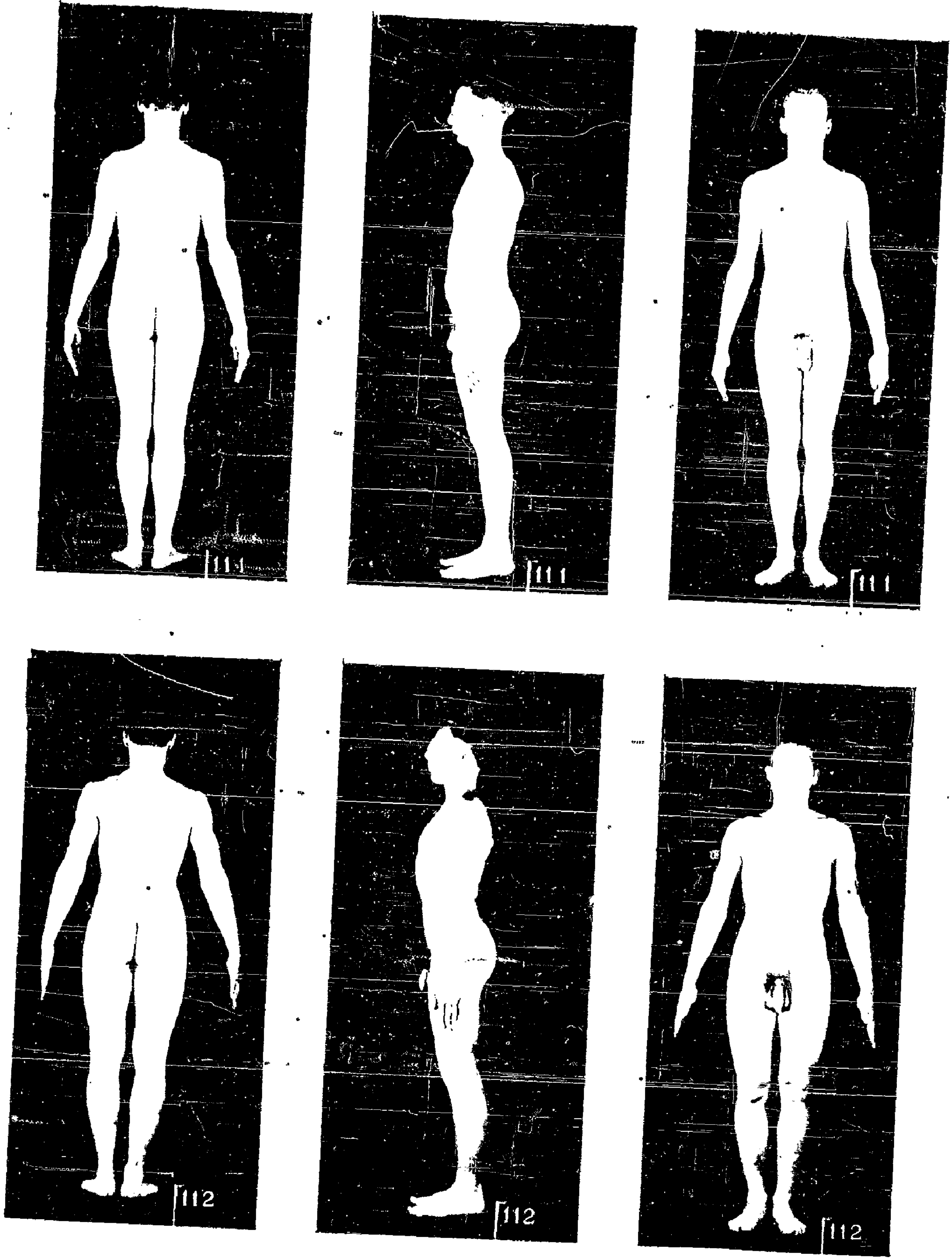


Figure F-15. Group 11 (subjects 1 and 2)

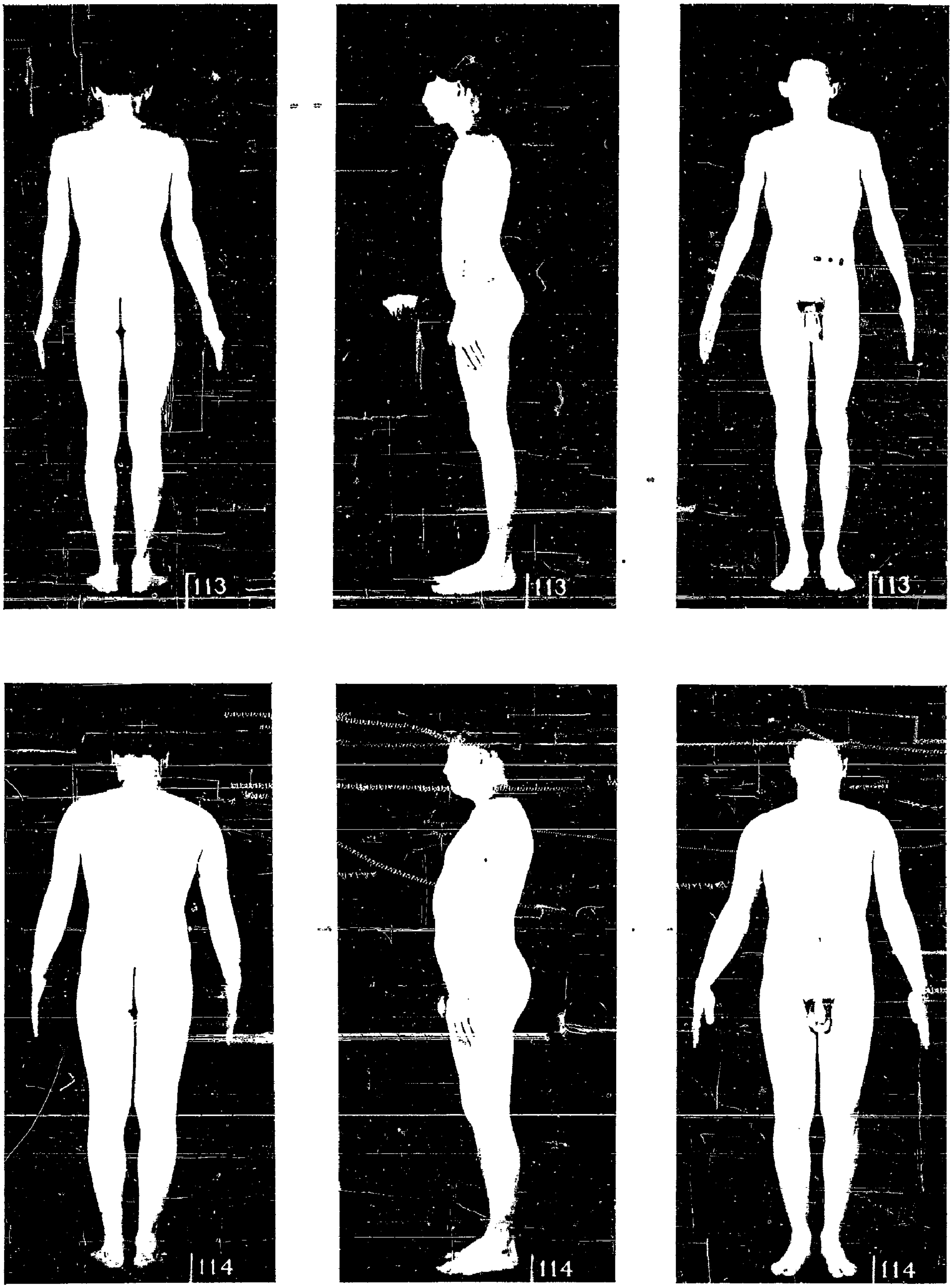


Figure F-15. Group 11 (subjects 3 and 4)

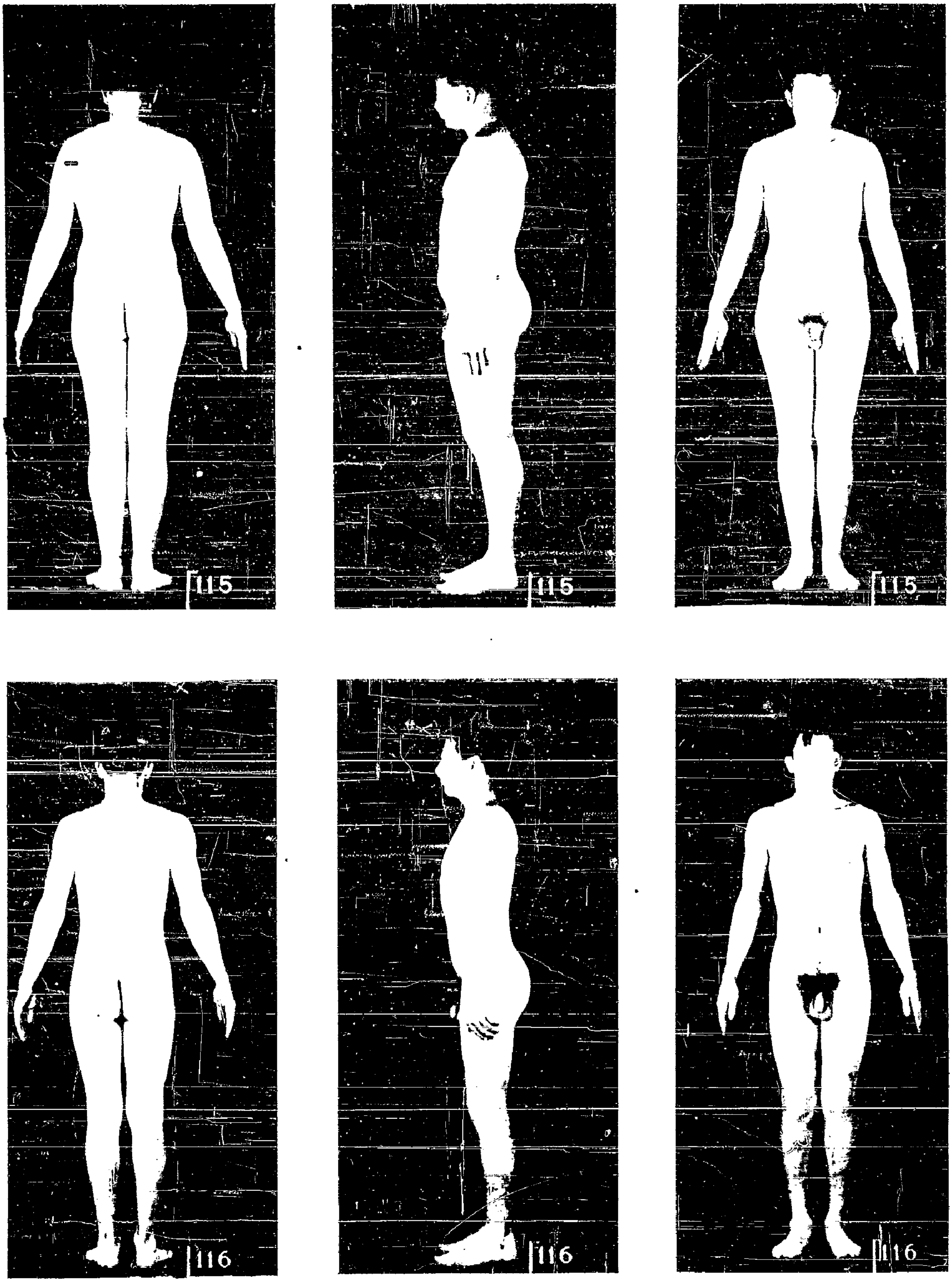


Figure F-15. Group 11 (subjects 5 and 6)

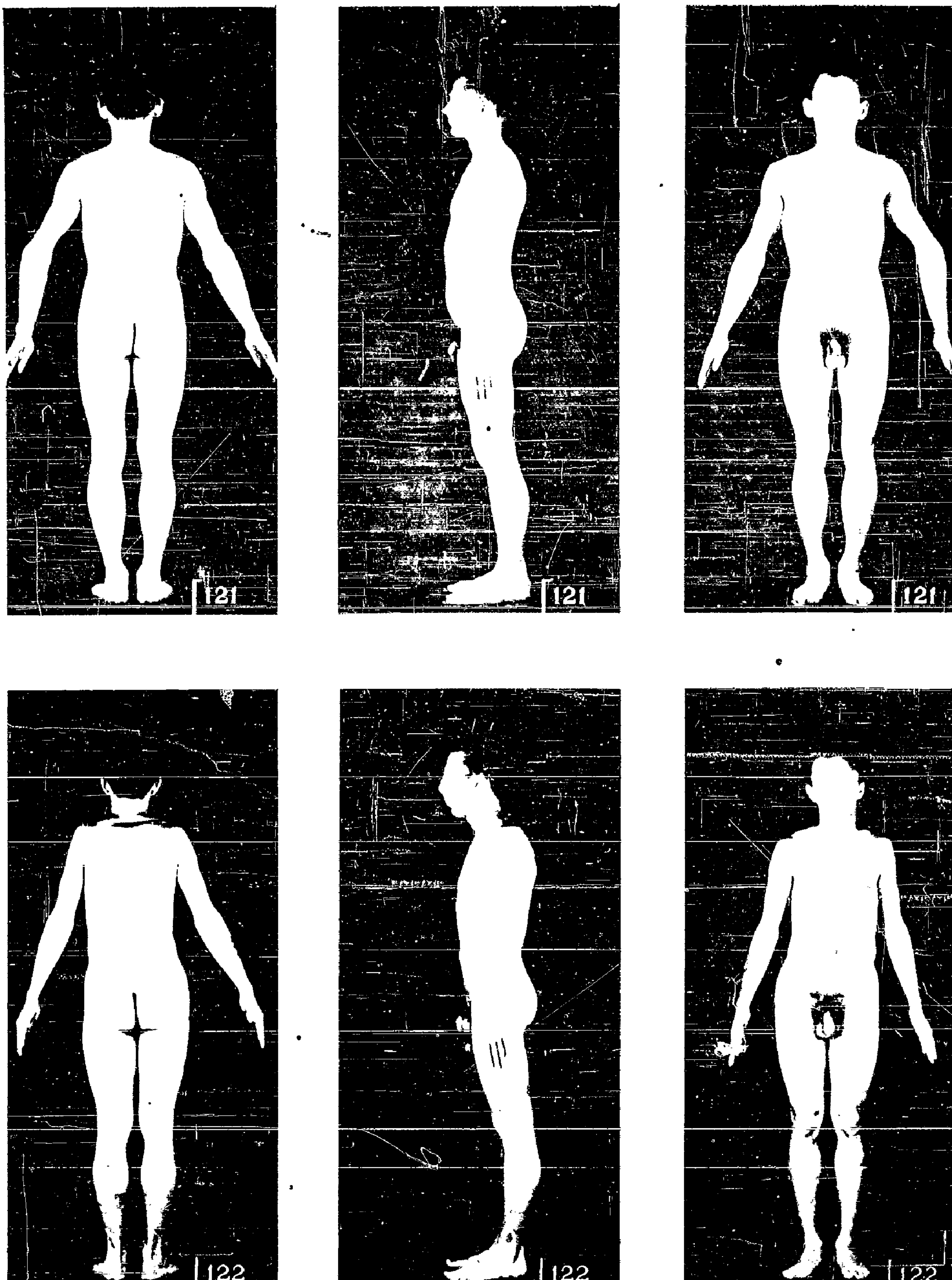


Figure F-16. Group 12 (subjects 1 and 2)

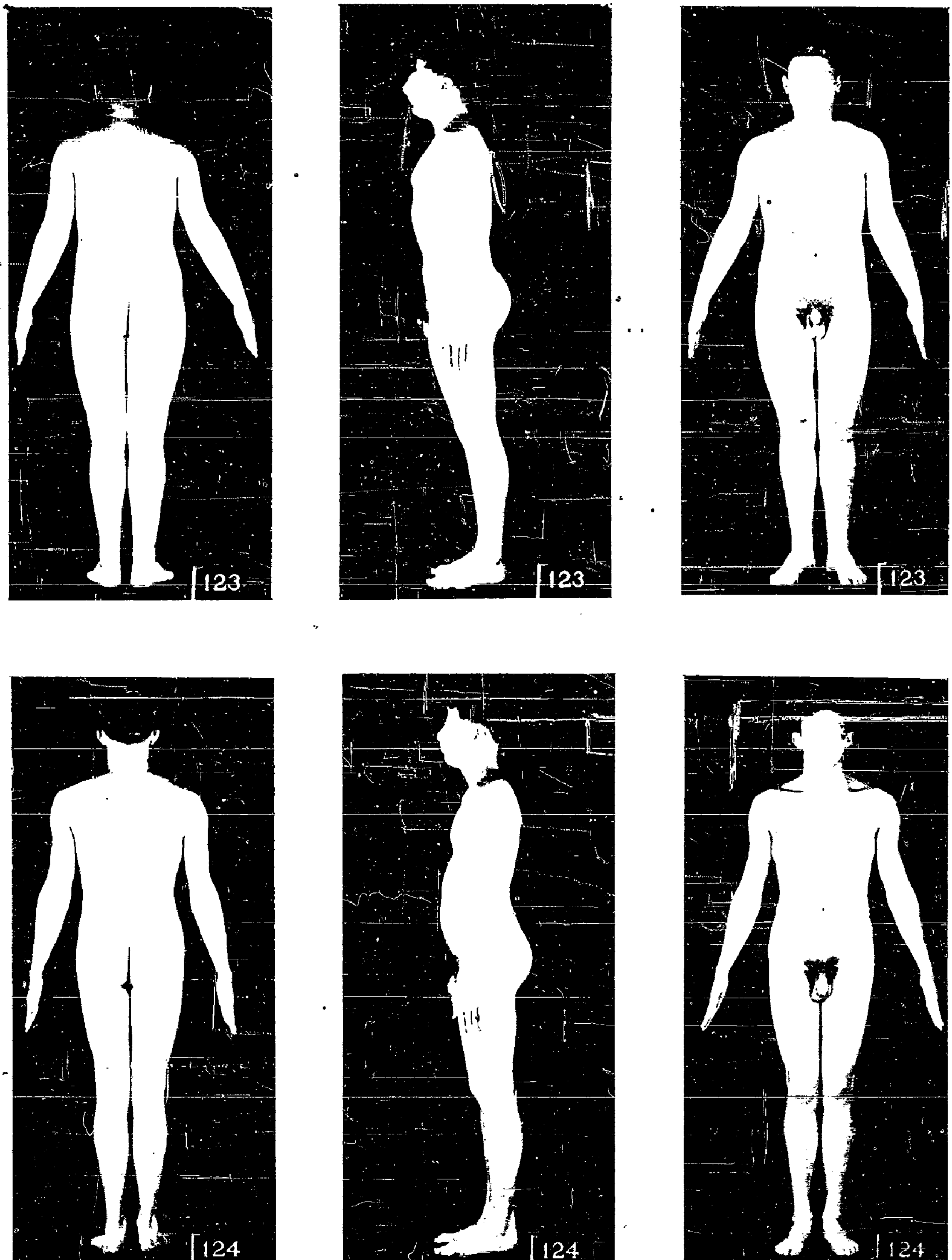


Figure F-16. Group 12 (subjects 3 and 4)

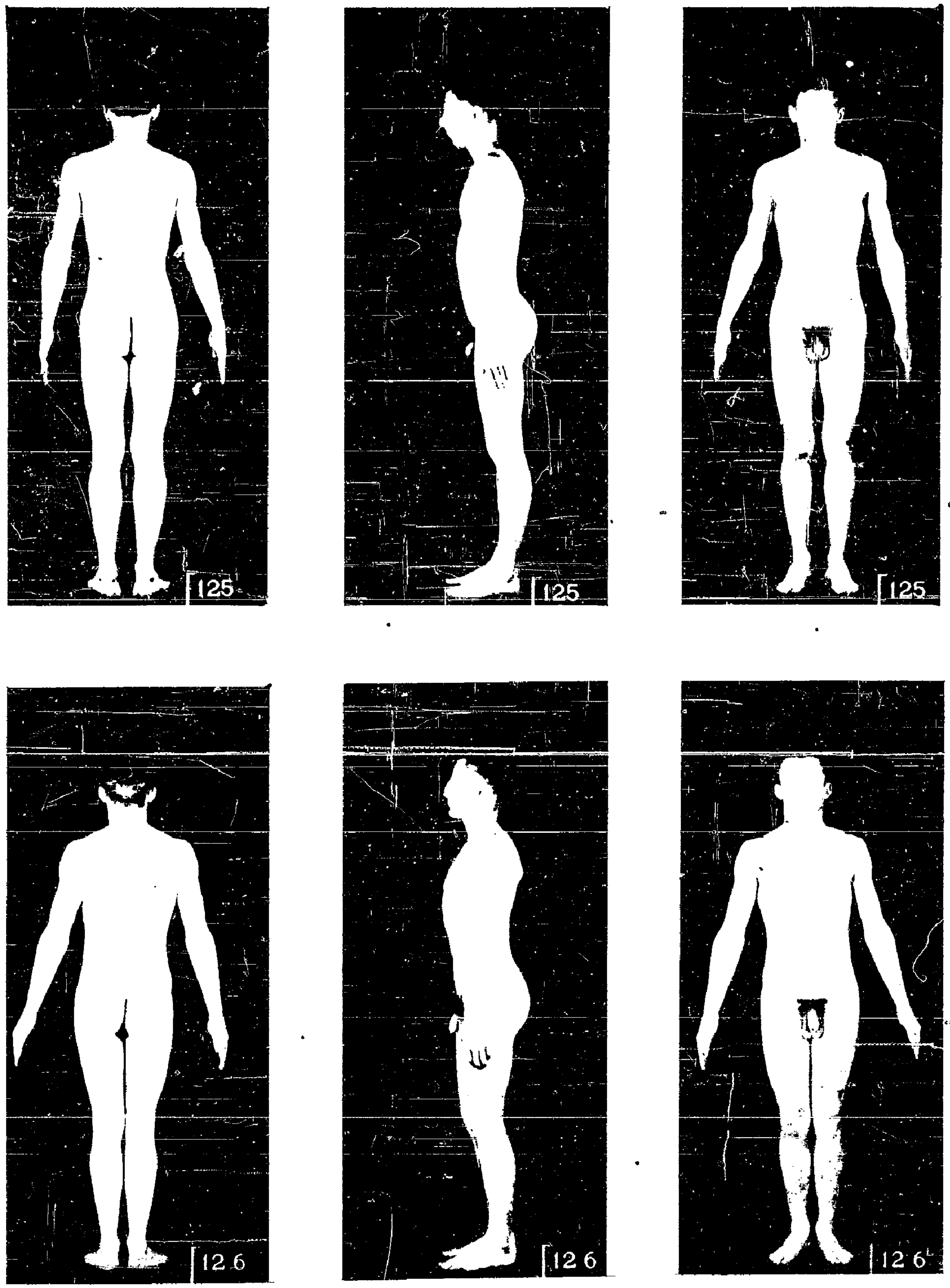


Figure F-16. Group 12 (subjects 5 and 6)

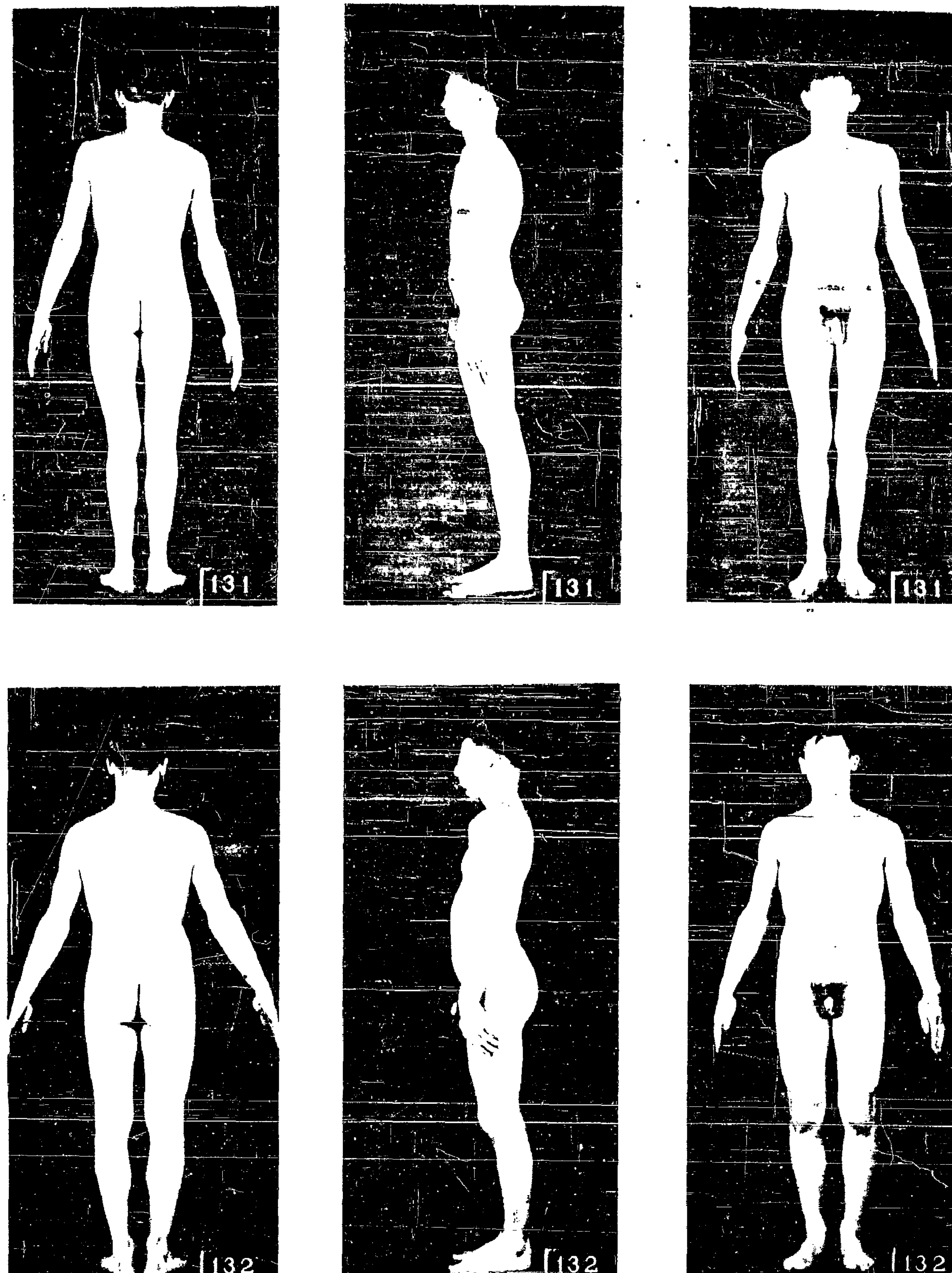


Figure F-17. Group 13 (subjects 1 and 2)

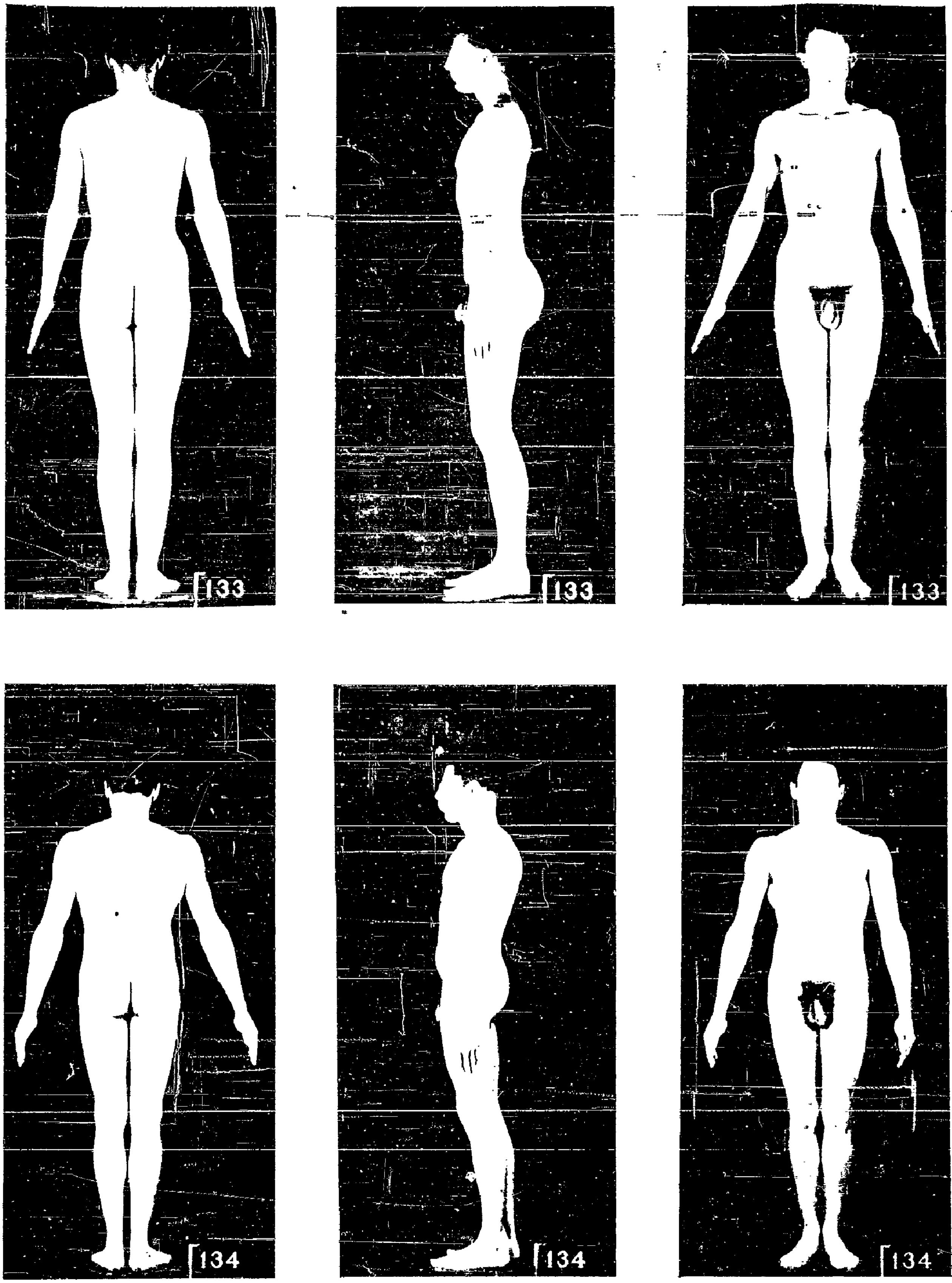


Figure F-17. Group 13 (subjects 3 and 4)

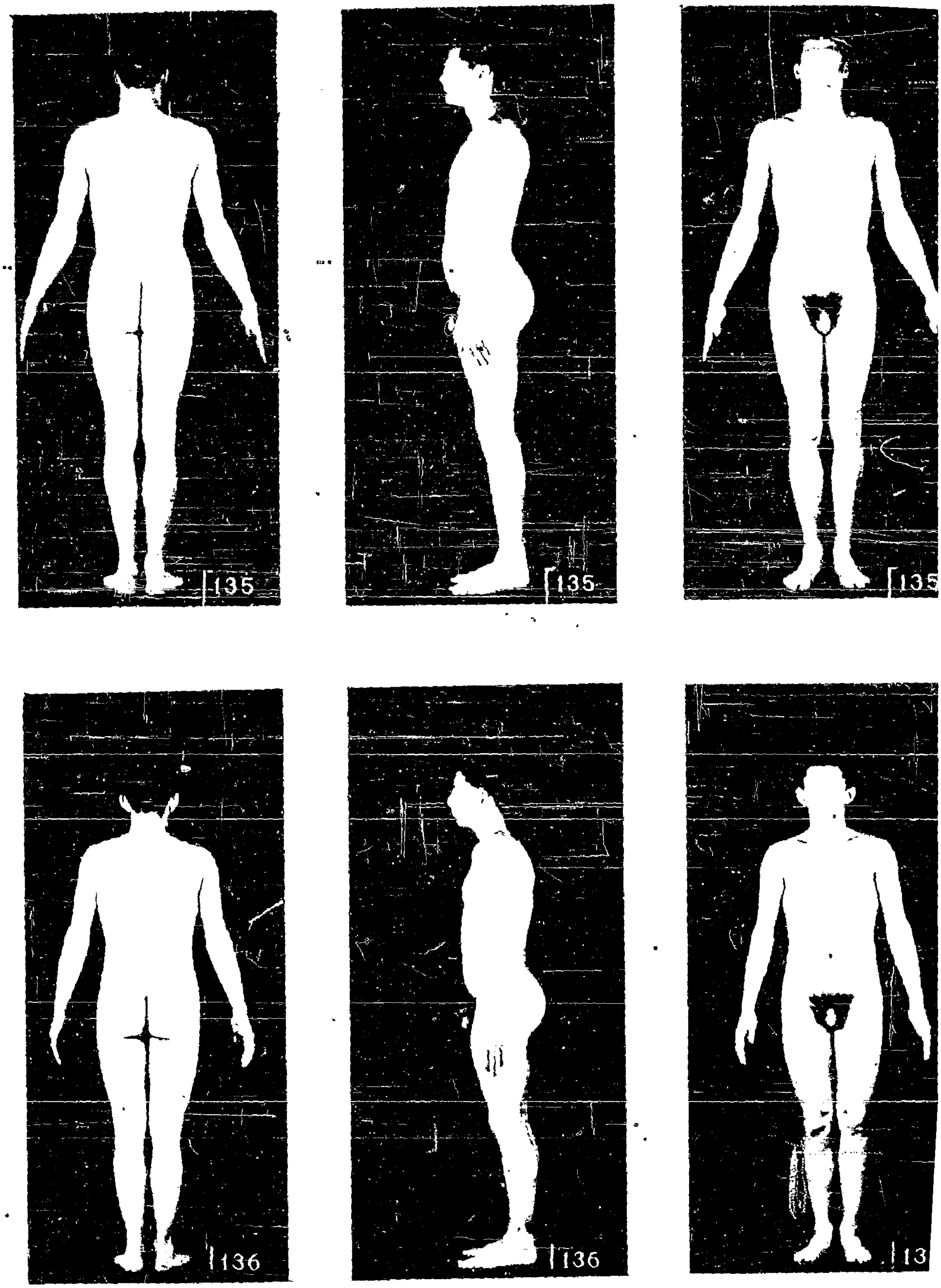


Figure F-17. Group 13 (subjects 5 and 6)

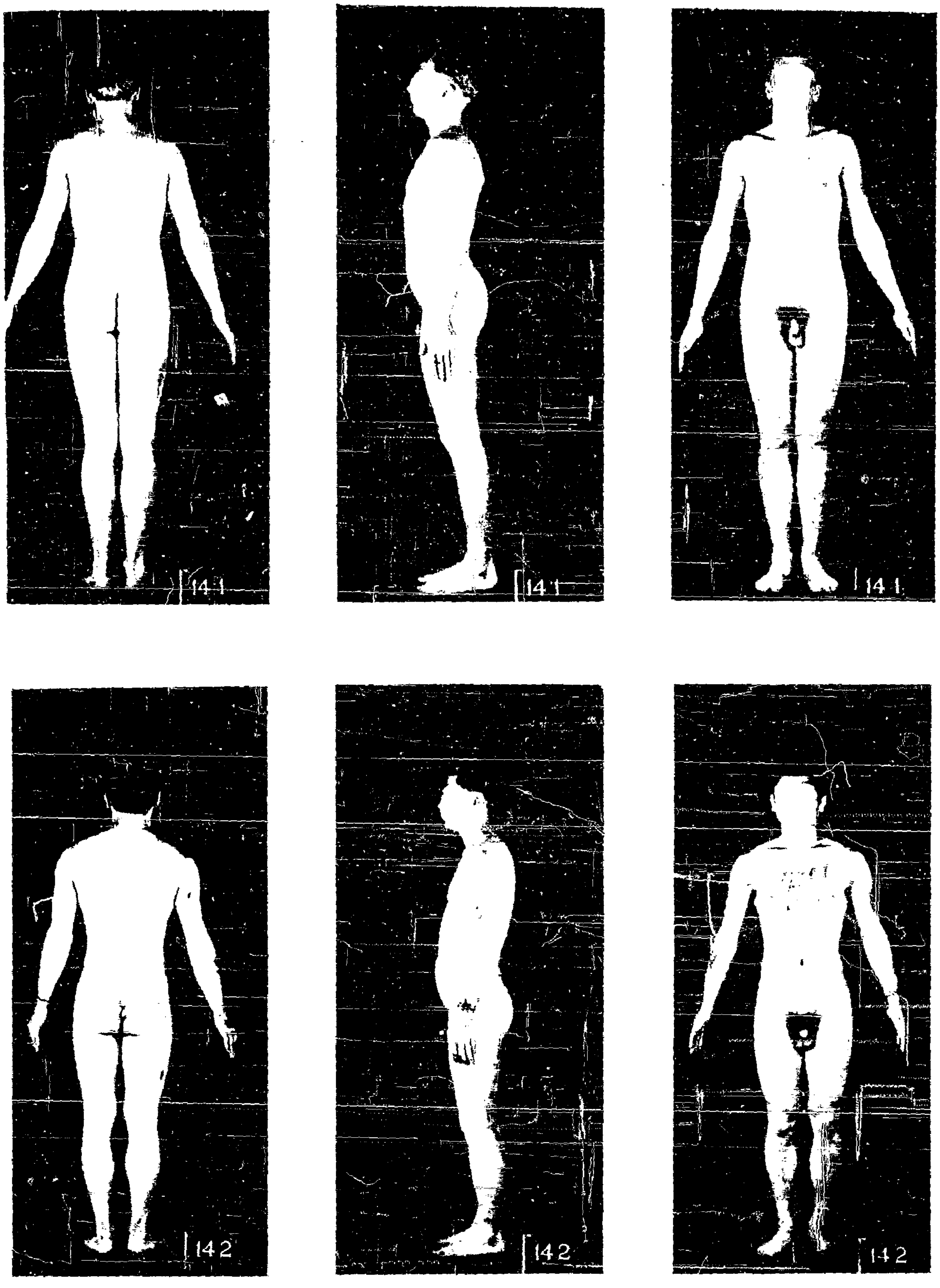


Figure F-18. Group 14 (subjects 1 and 2)

(Subject 3, Group 14, photograph not available)

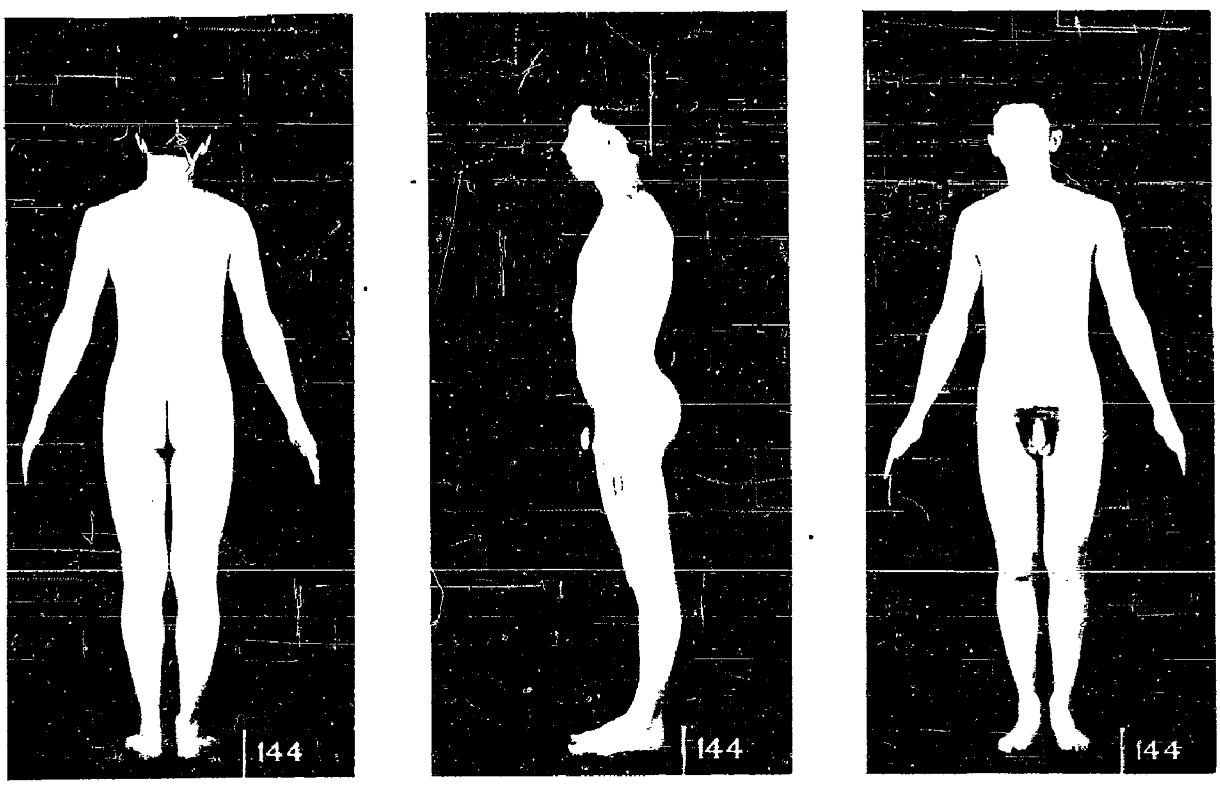


Figure F-18. Group 14 (subject 4)

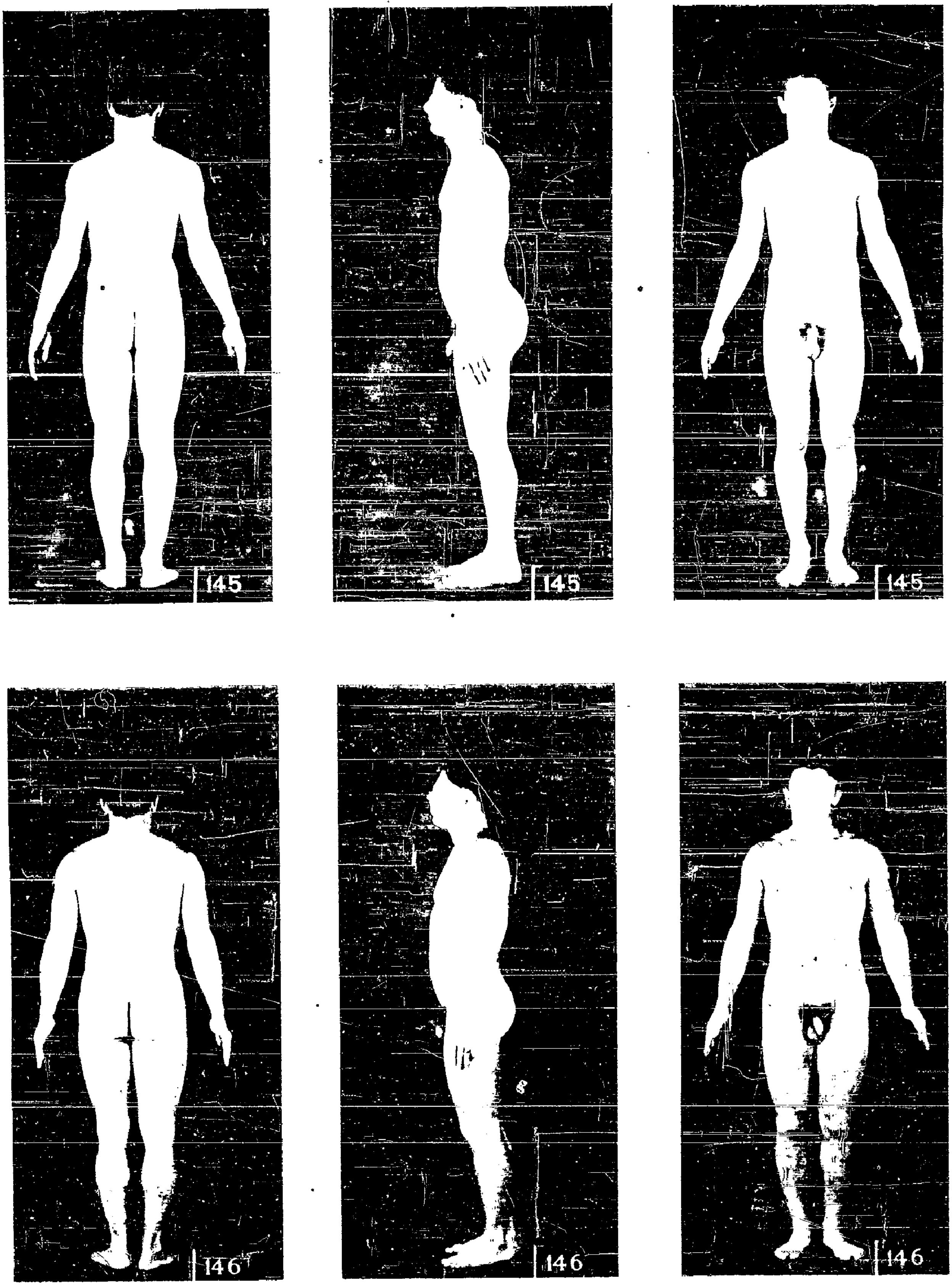


Figure F-18. Group 14 (subjects 5 and 6)

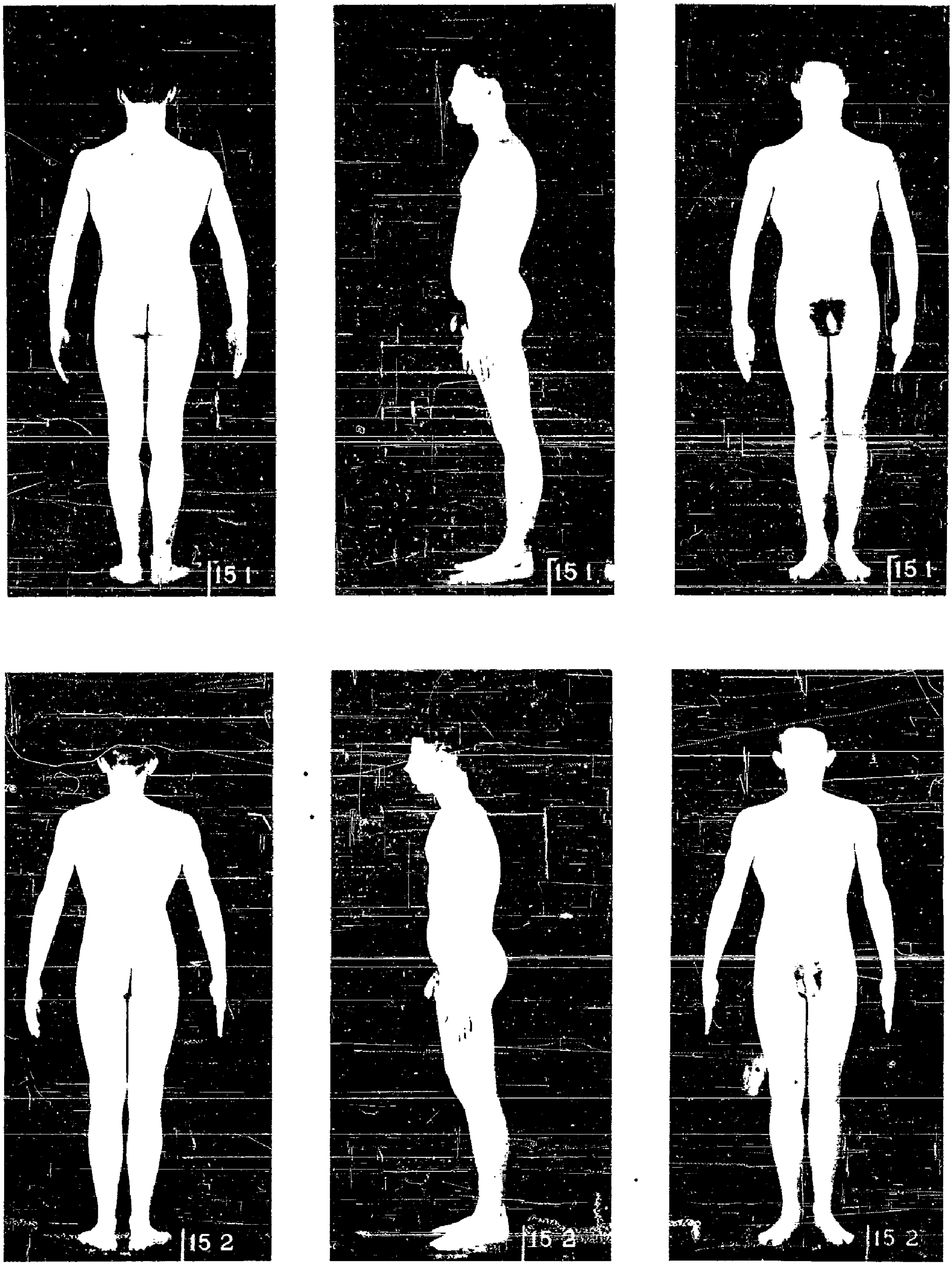


Figure F-19. Group 15 (subjects 1 and 2)

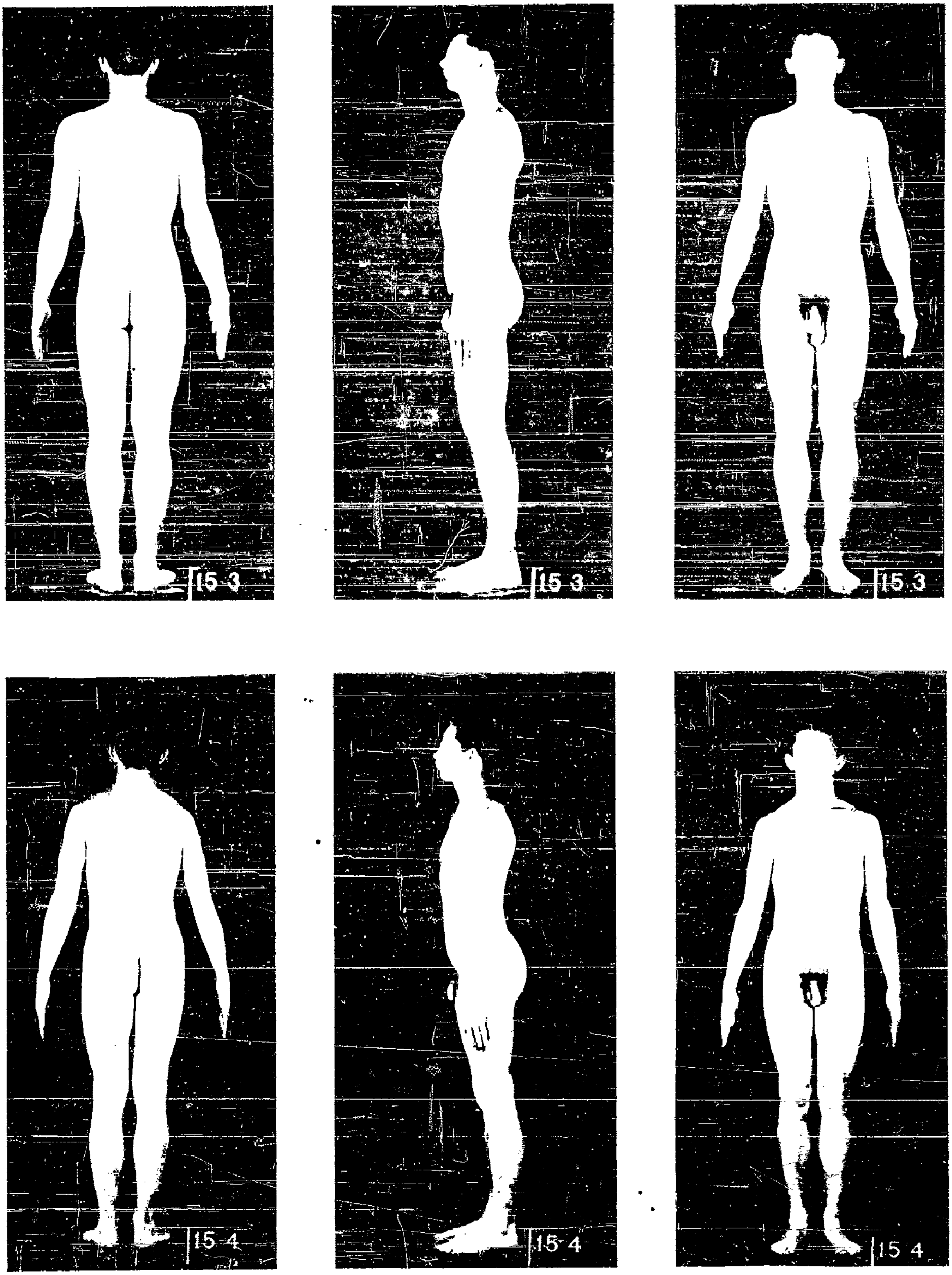


Figure F-19. Group 15 (subjects 3 and 4)

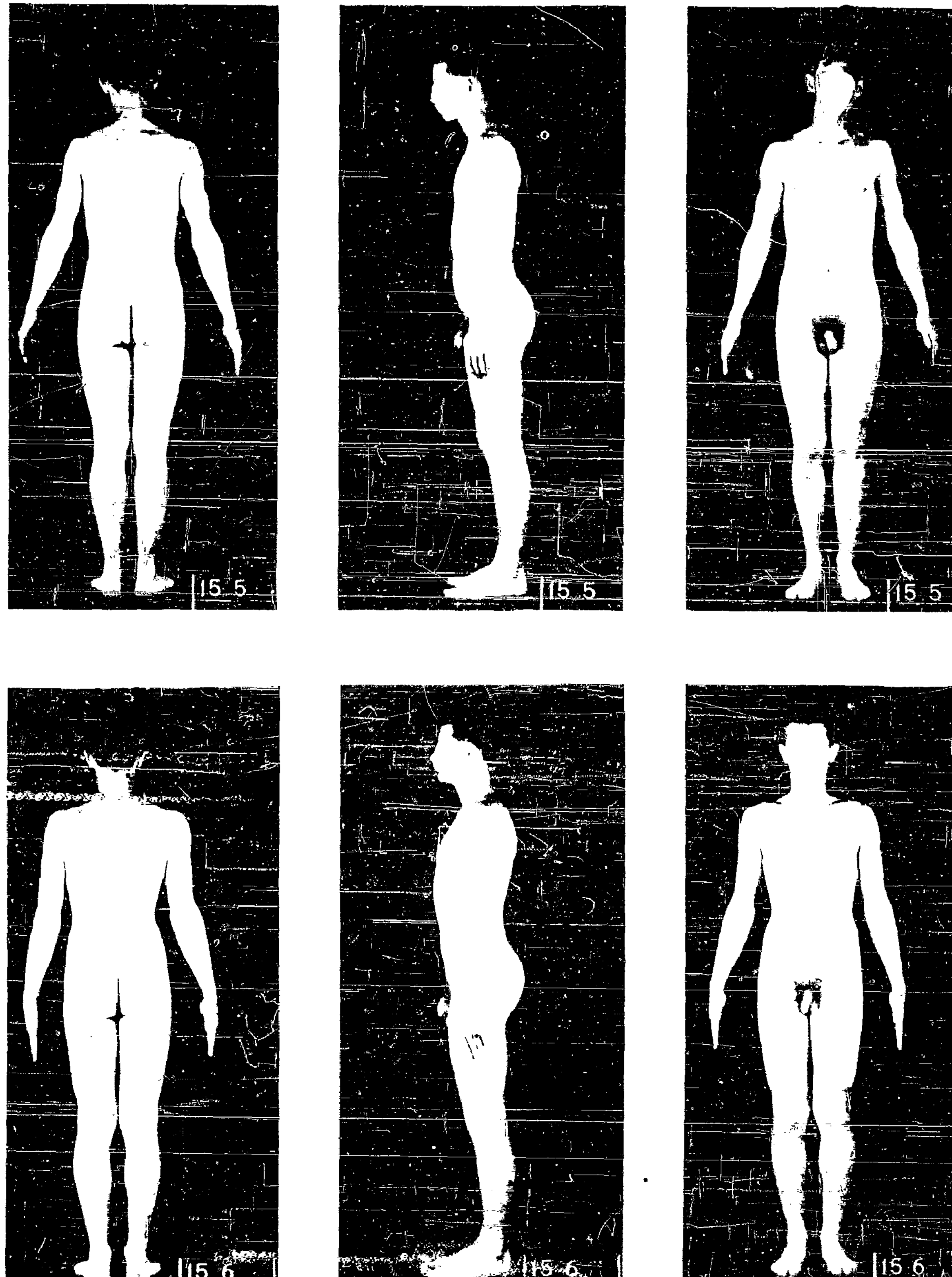


Figure F-19. Group 15 (subjects 5 and 6)

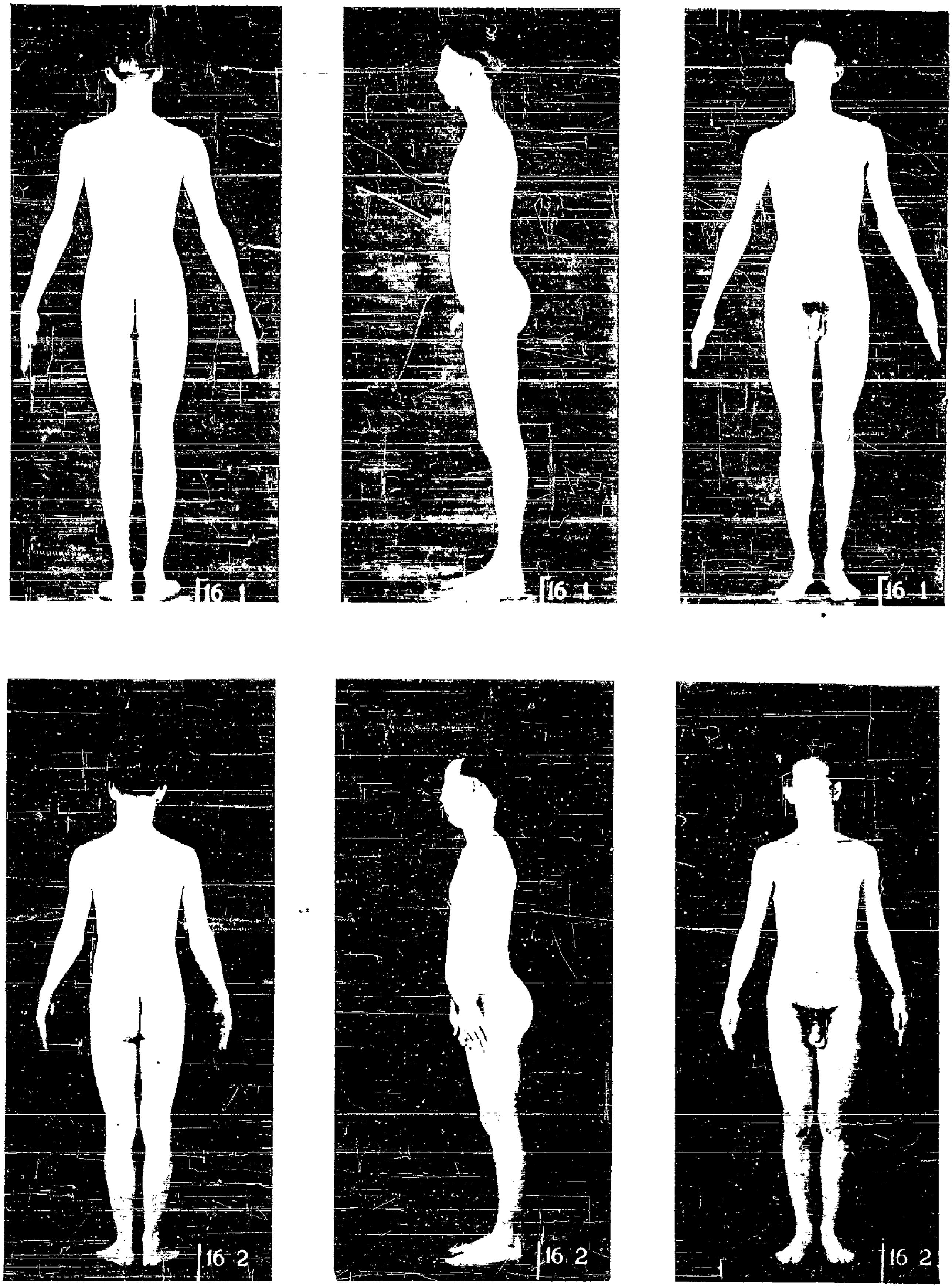


Figure F-20. Group 16 (subjects 1 and 2)

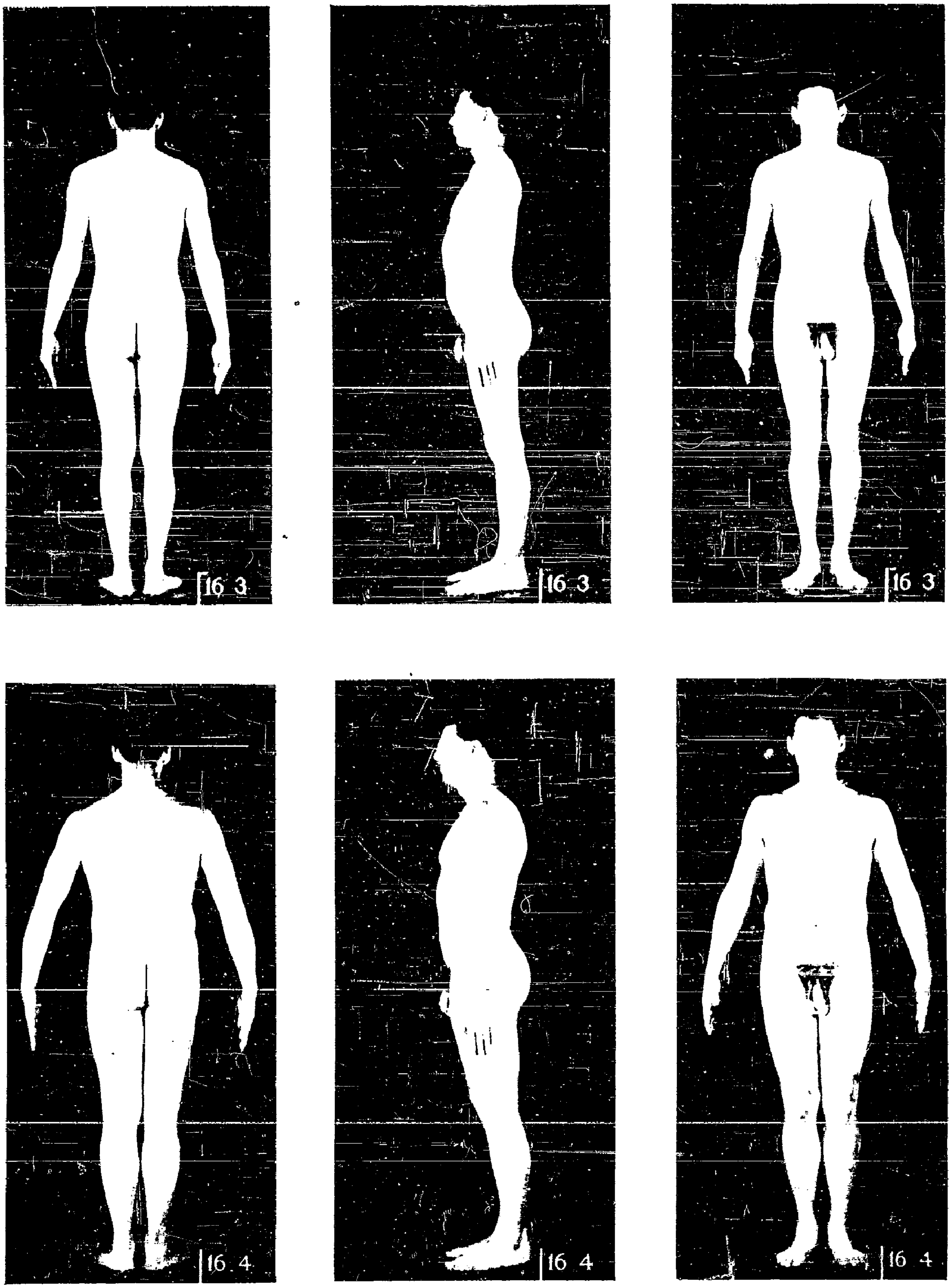


Figure F-20. Group 16 (subjects 3 and 4)

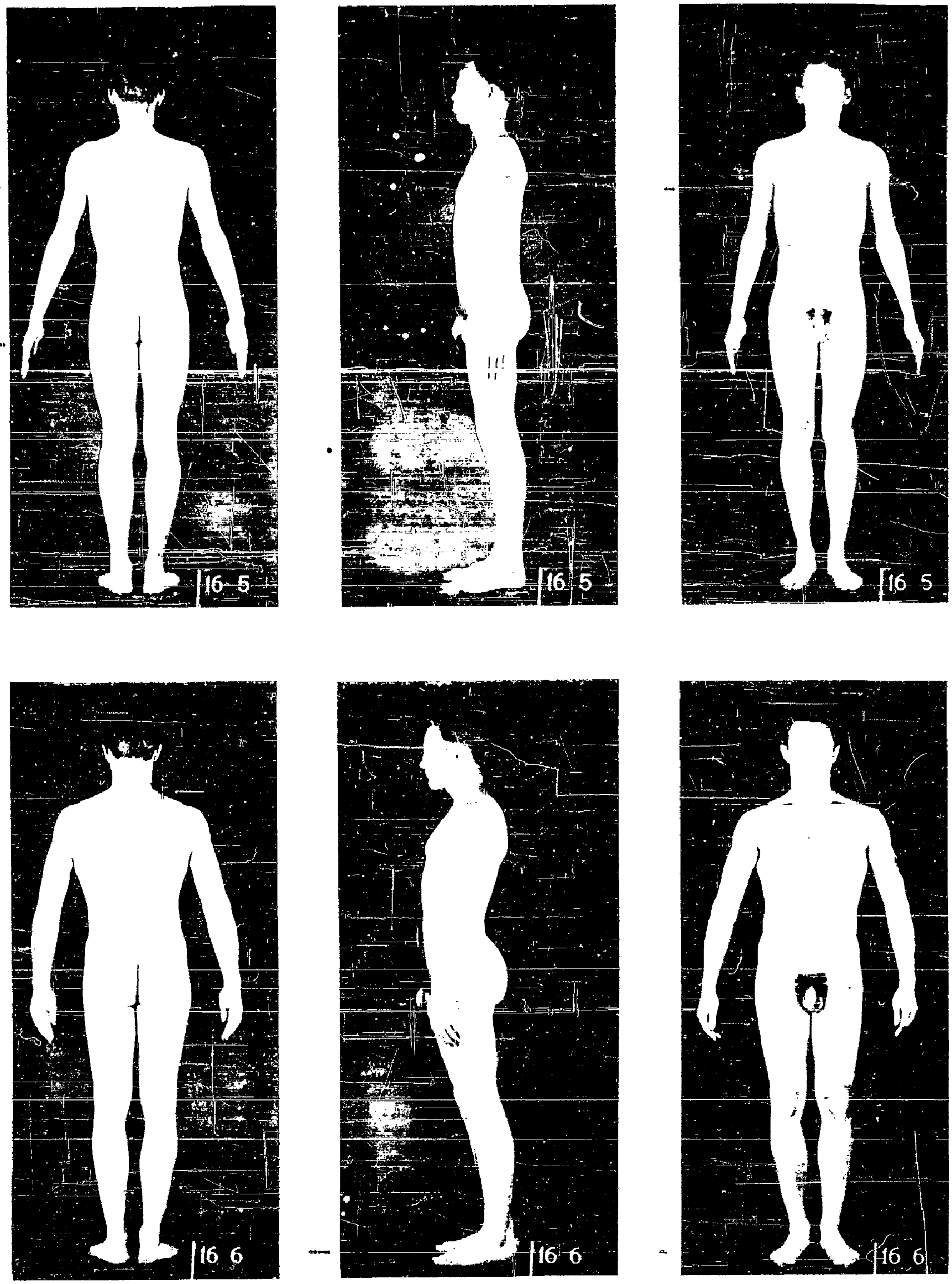


Figure F-20. Group 16 (subjects 5 and 6)

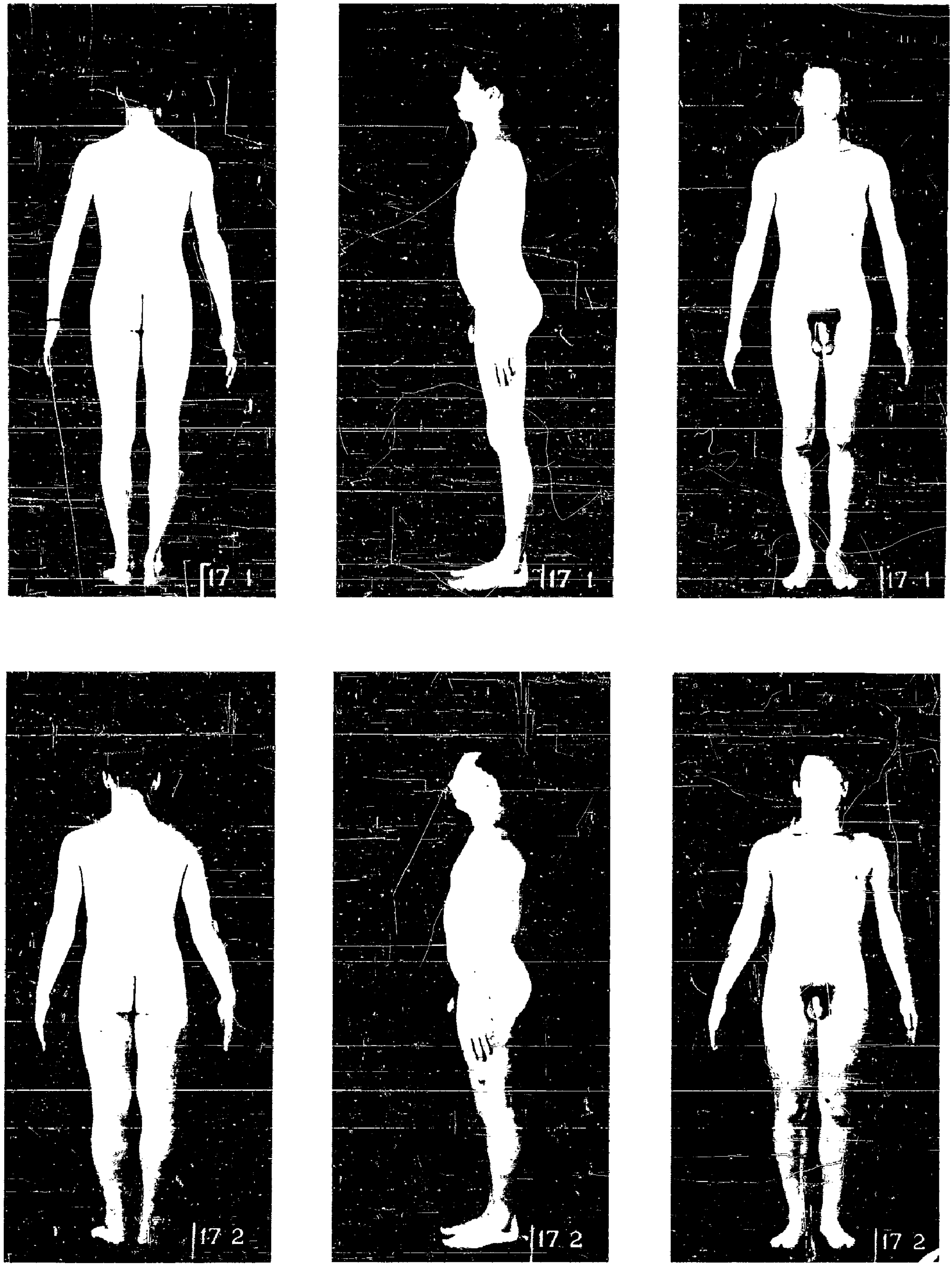


Figure F-21. Group 17 (subjects 1 and 2)

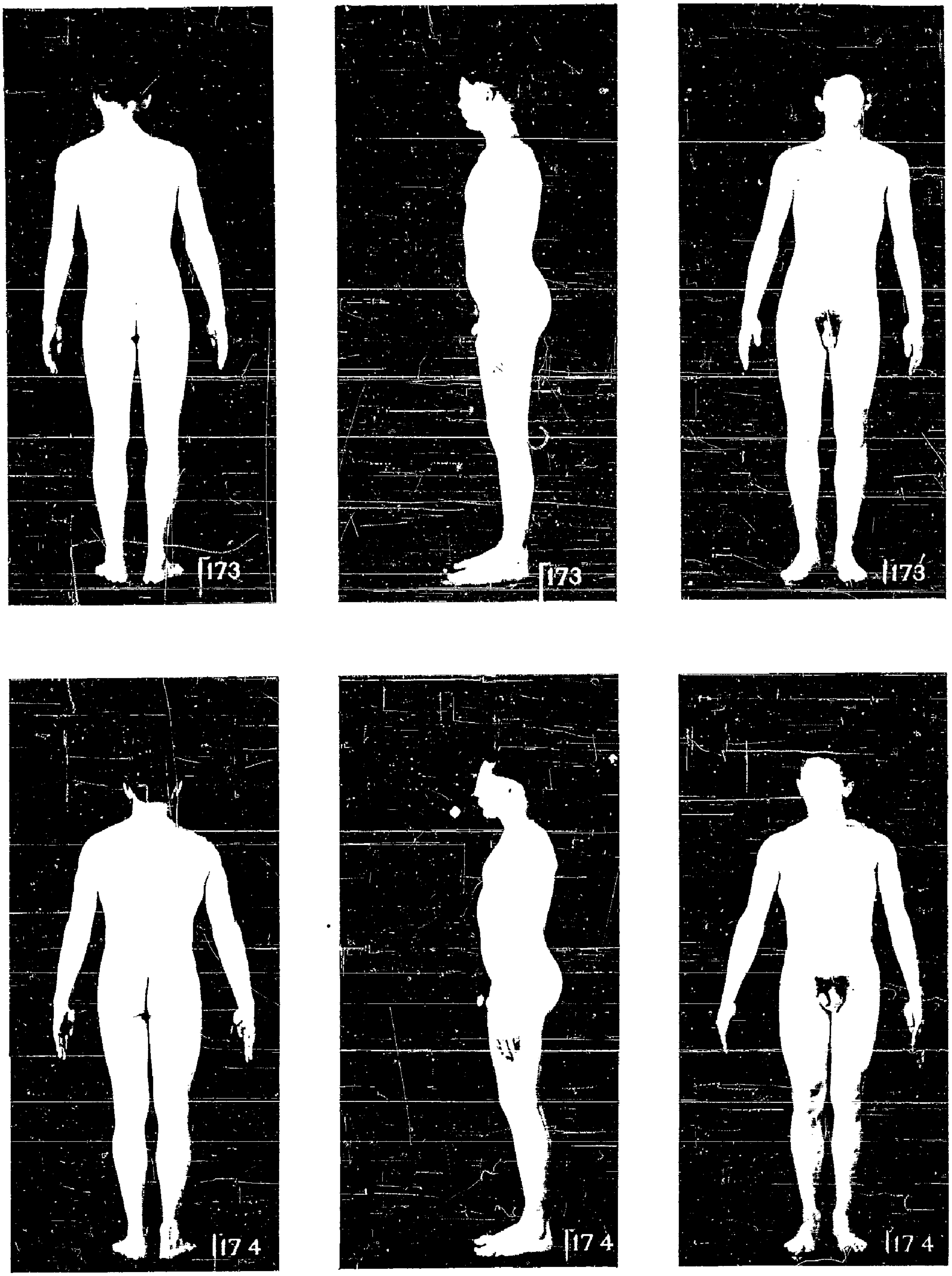


Figure F-21. Group 17 (subjects 3 and 4)

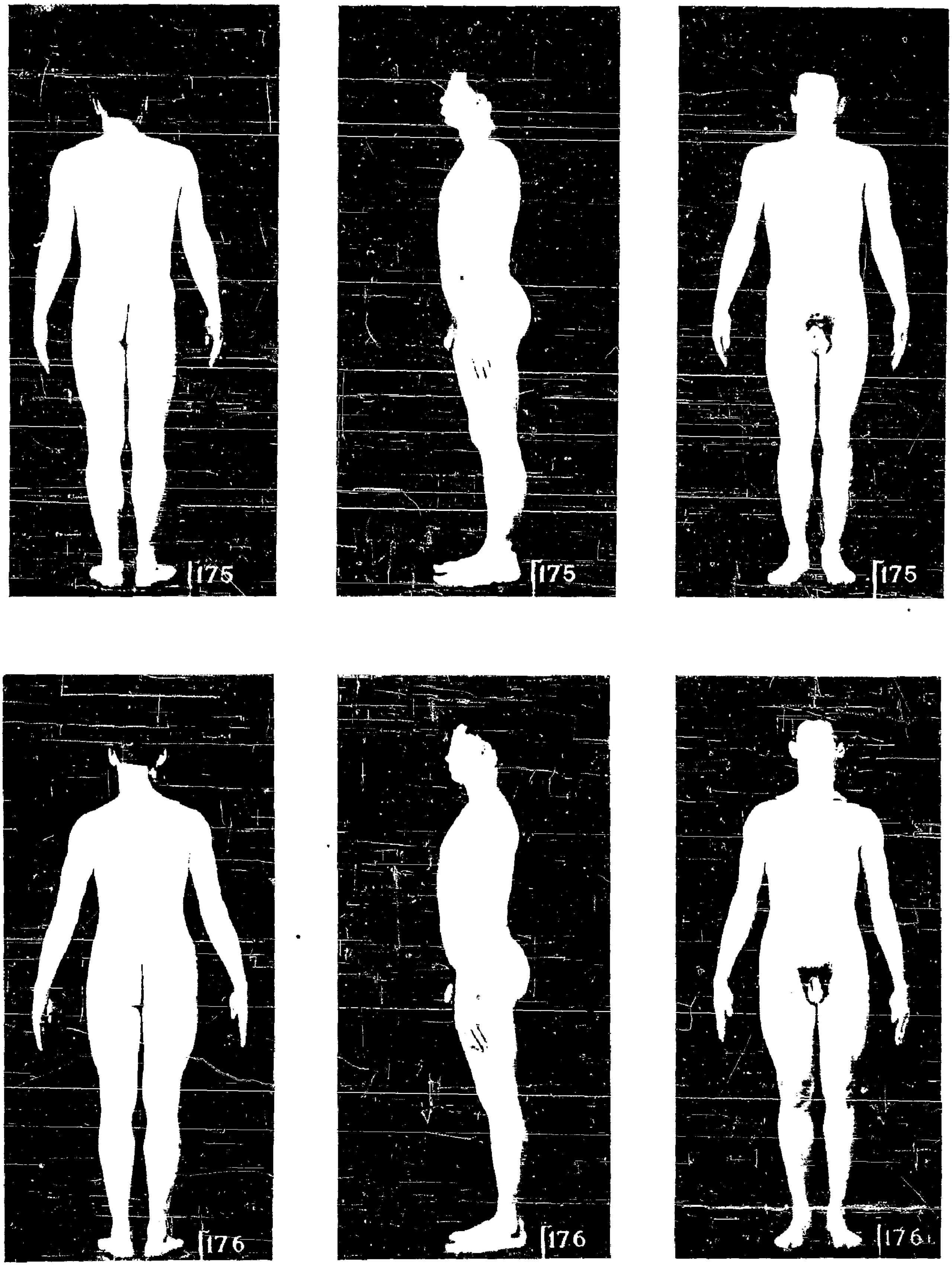
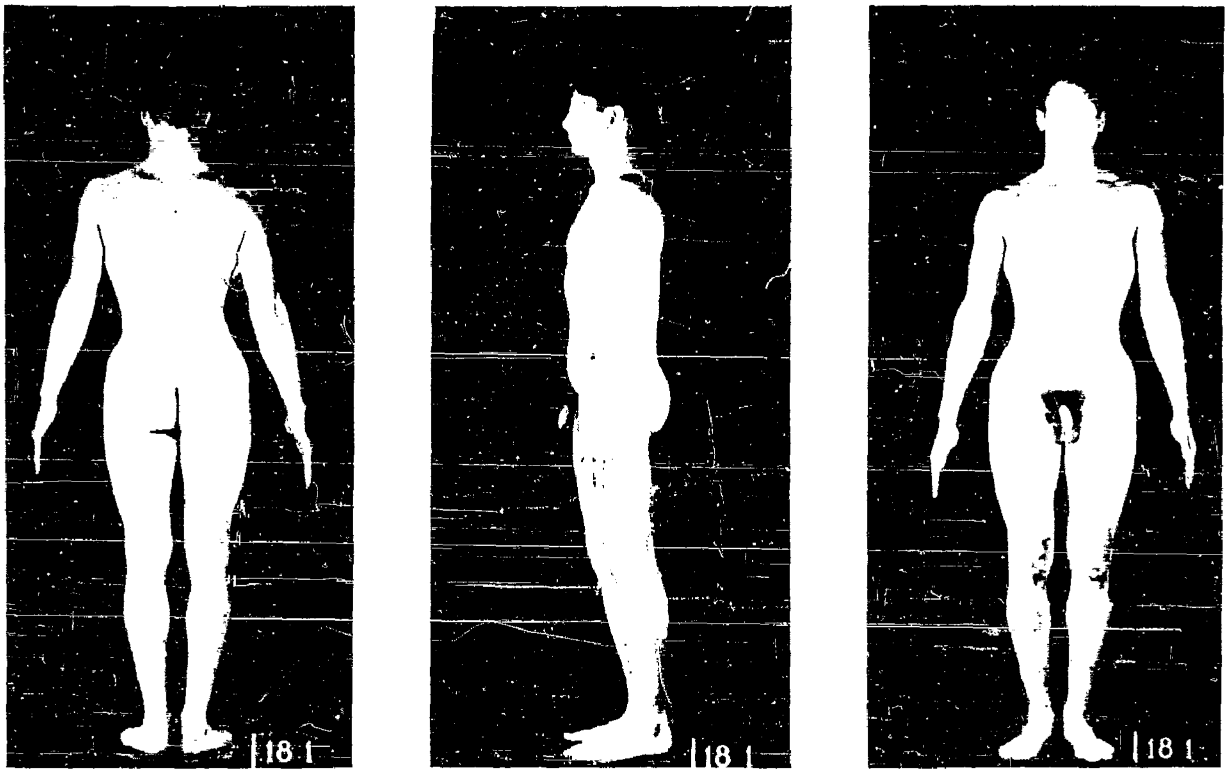


Figure F-21. Group 17 (subjects 5 and 6)



(Subject 2, Group 18 - photograph not available)

Figure F-22. Group 18 (subject 1)

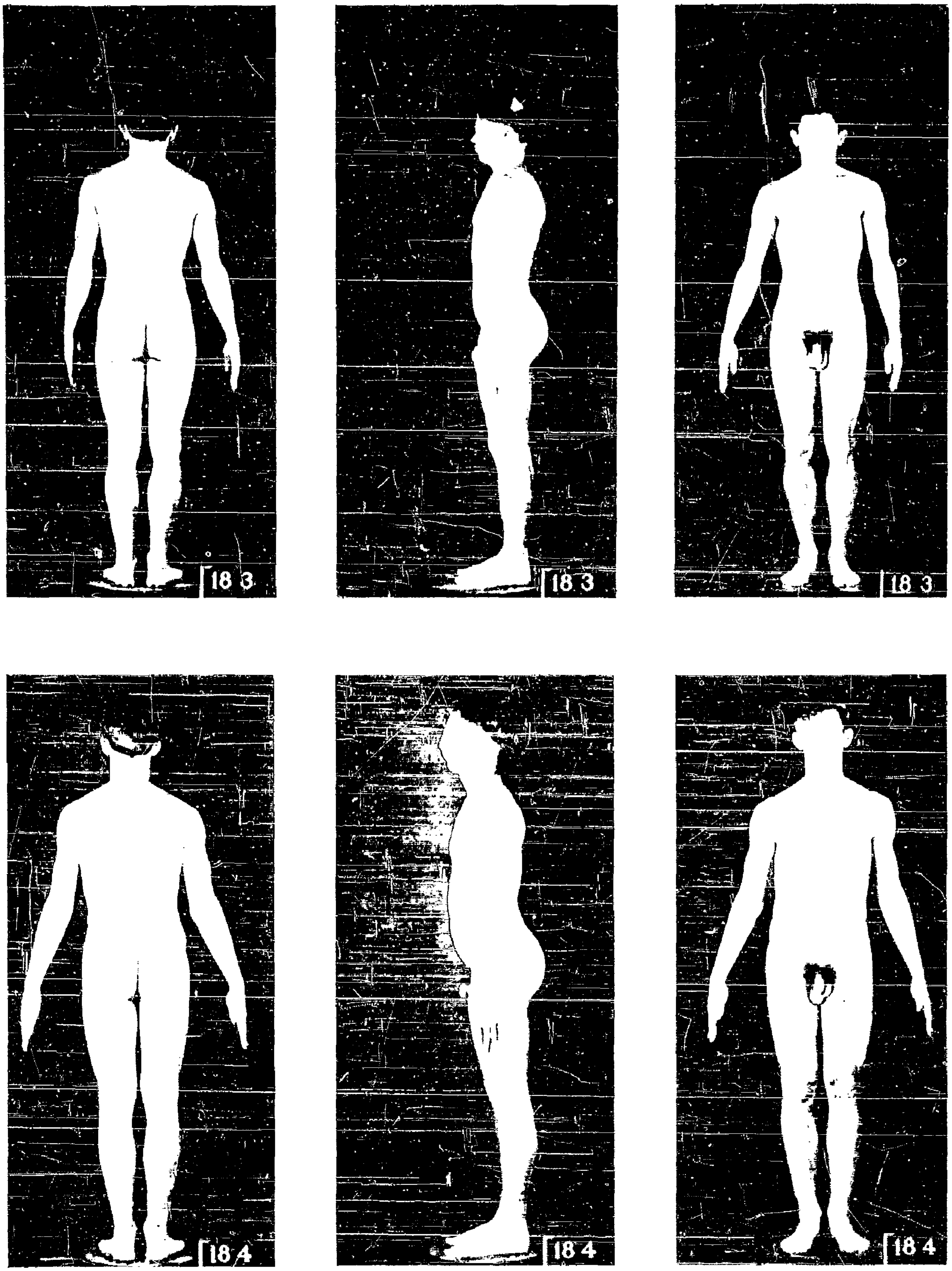


Figure F-22. Group 18 (subjects 3 and 4)

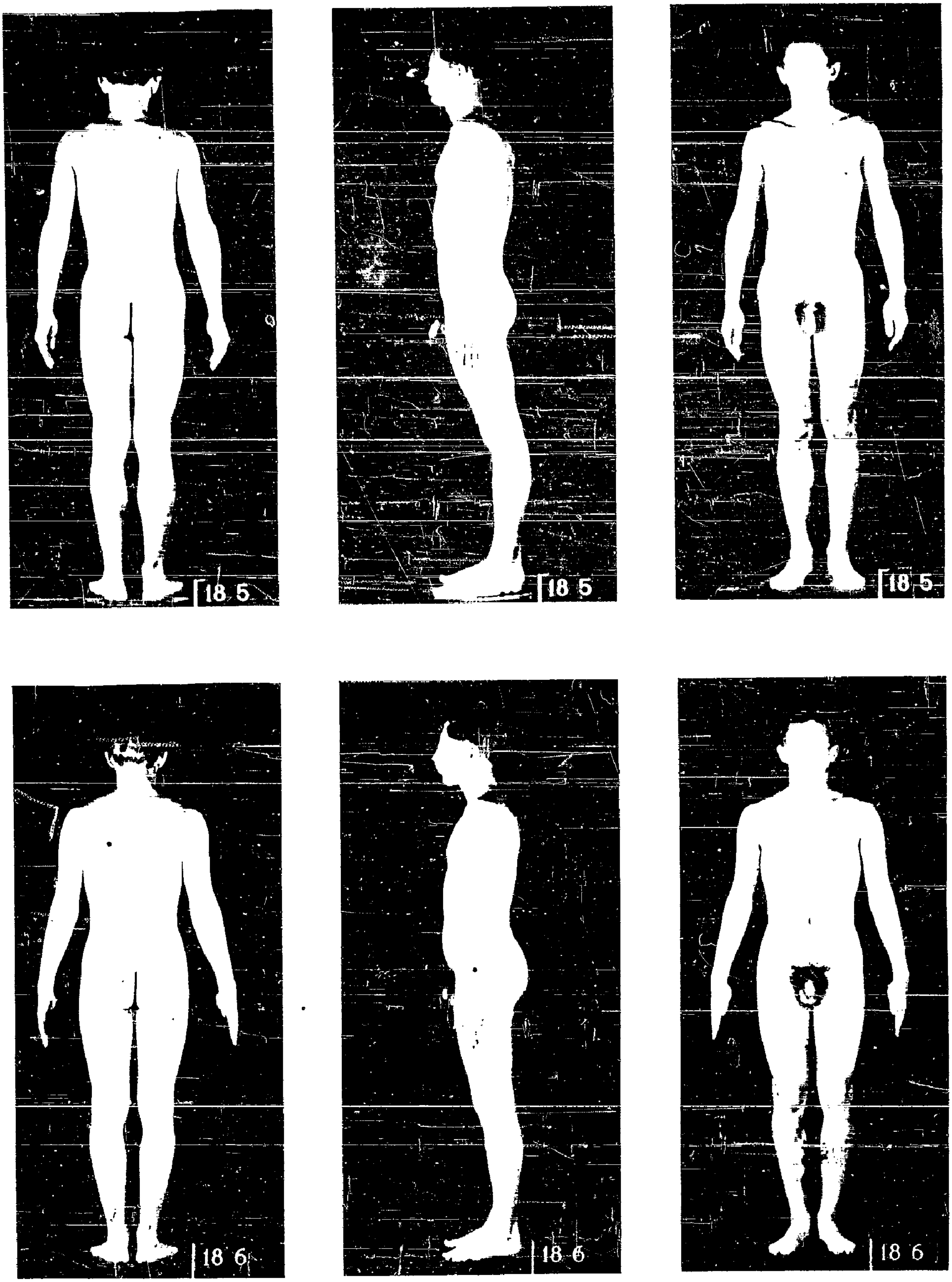


Figure F-22. Group 18 (subjects 5 and 6)

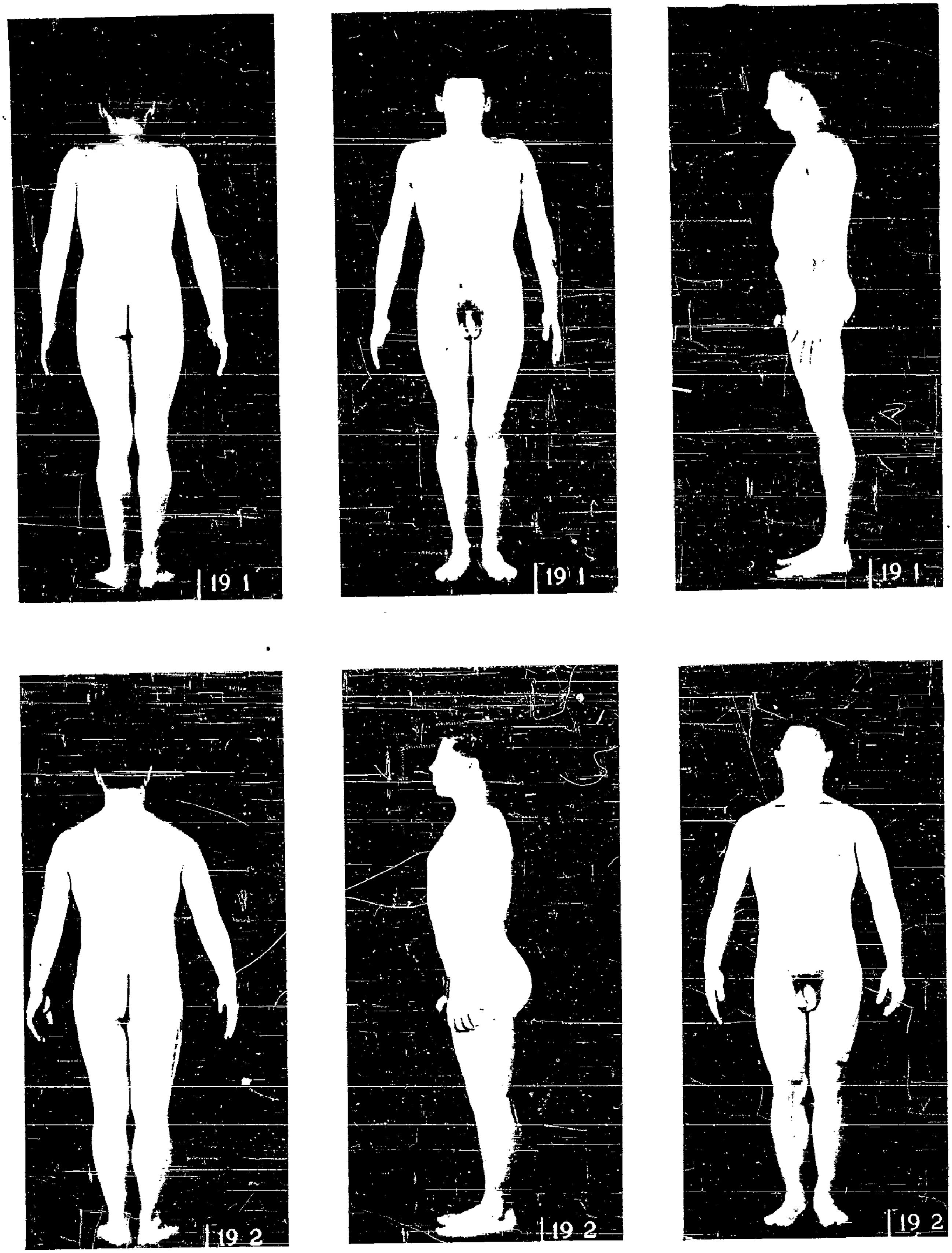


Figure F-23. Group 19 (subjects 1 and 2)

(Subject 4, Group 19 - photograph not available)

Figure F-23. Group 19 (subject 3)

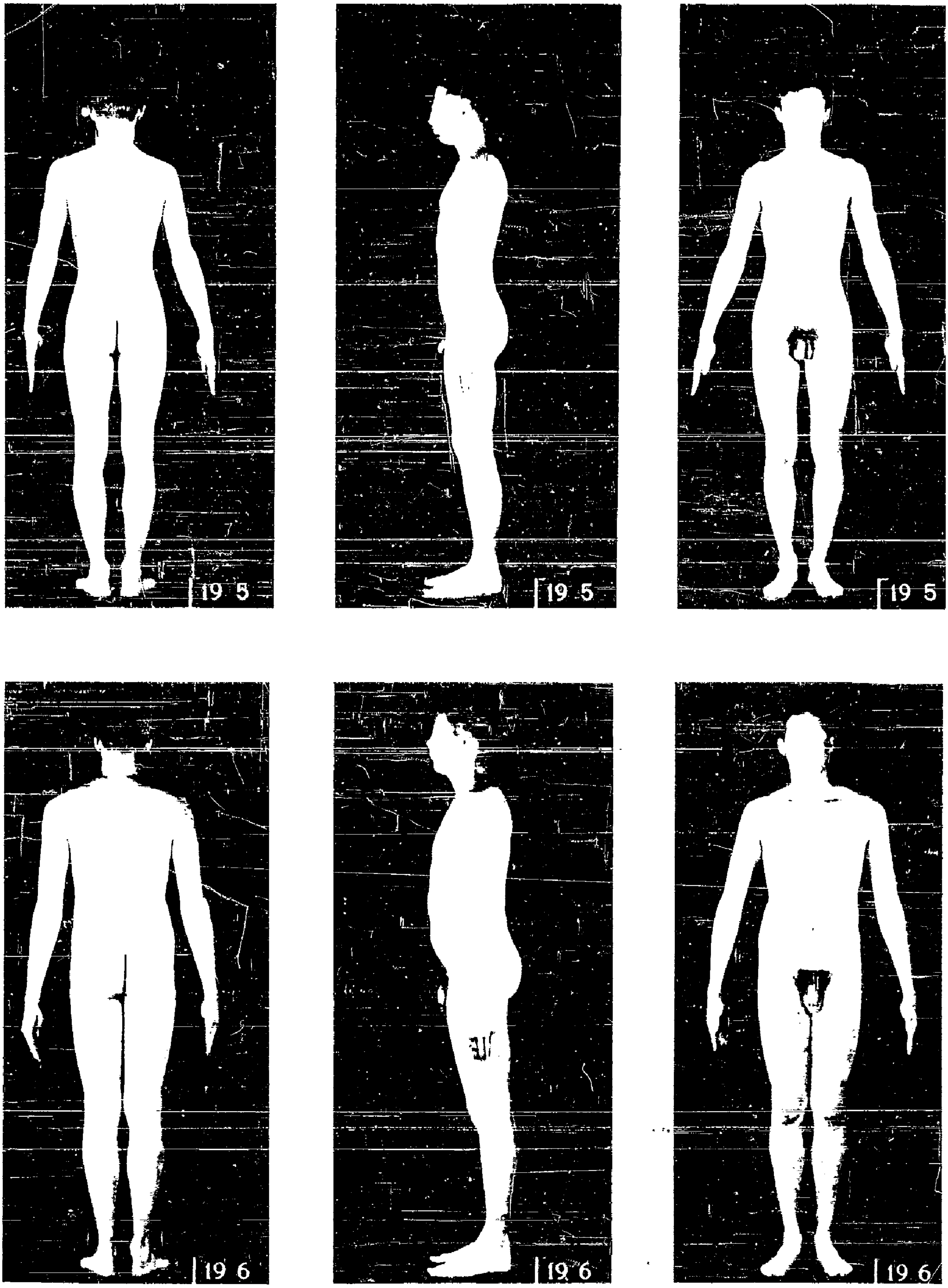


Figure F-23. Group 19 (subjects 5 and 6)

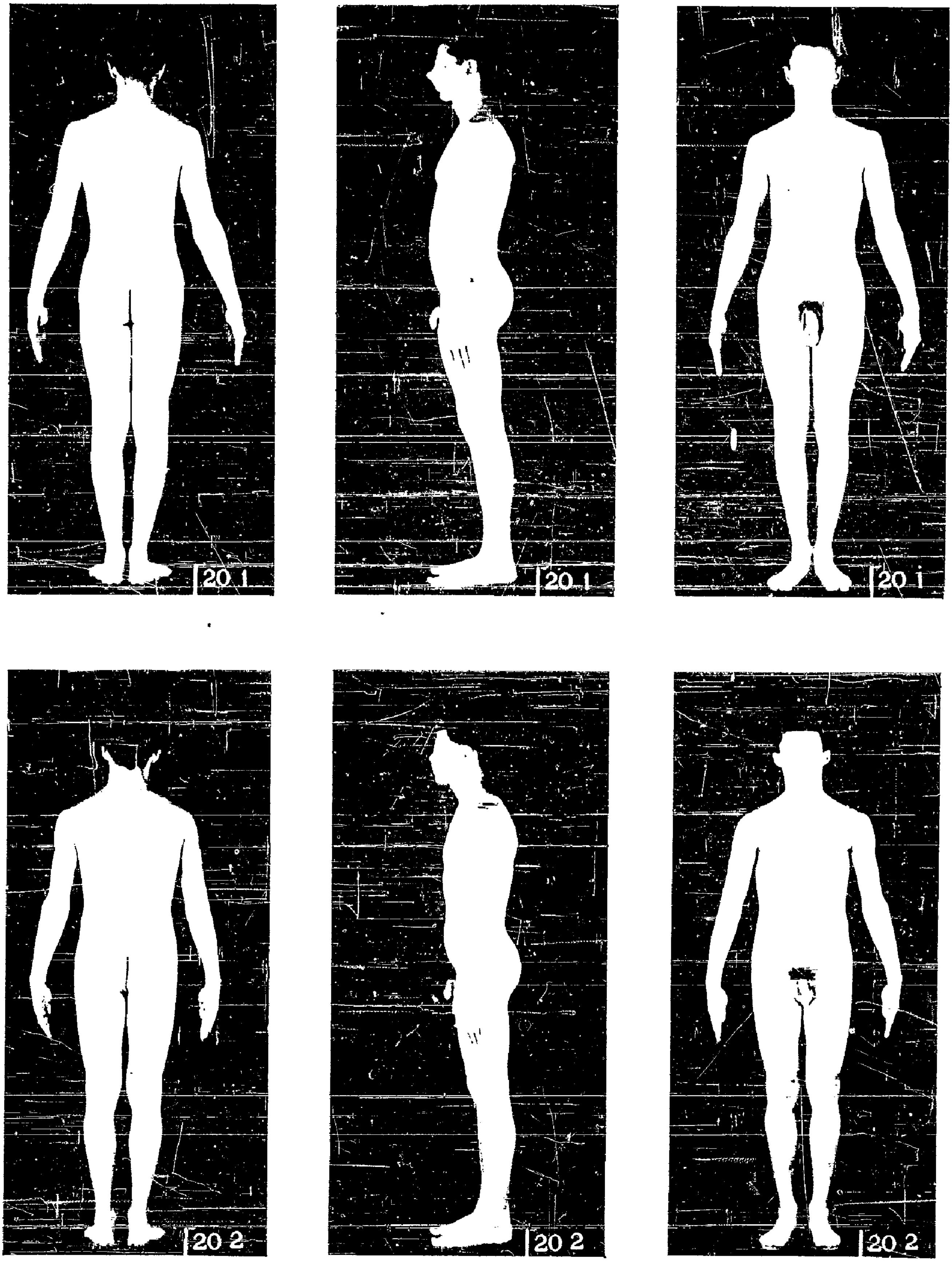


Figure F-24. Group 20 (subjects 1 and 2)

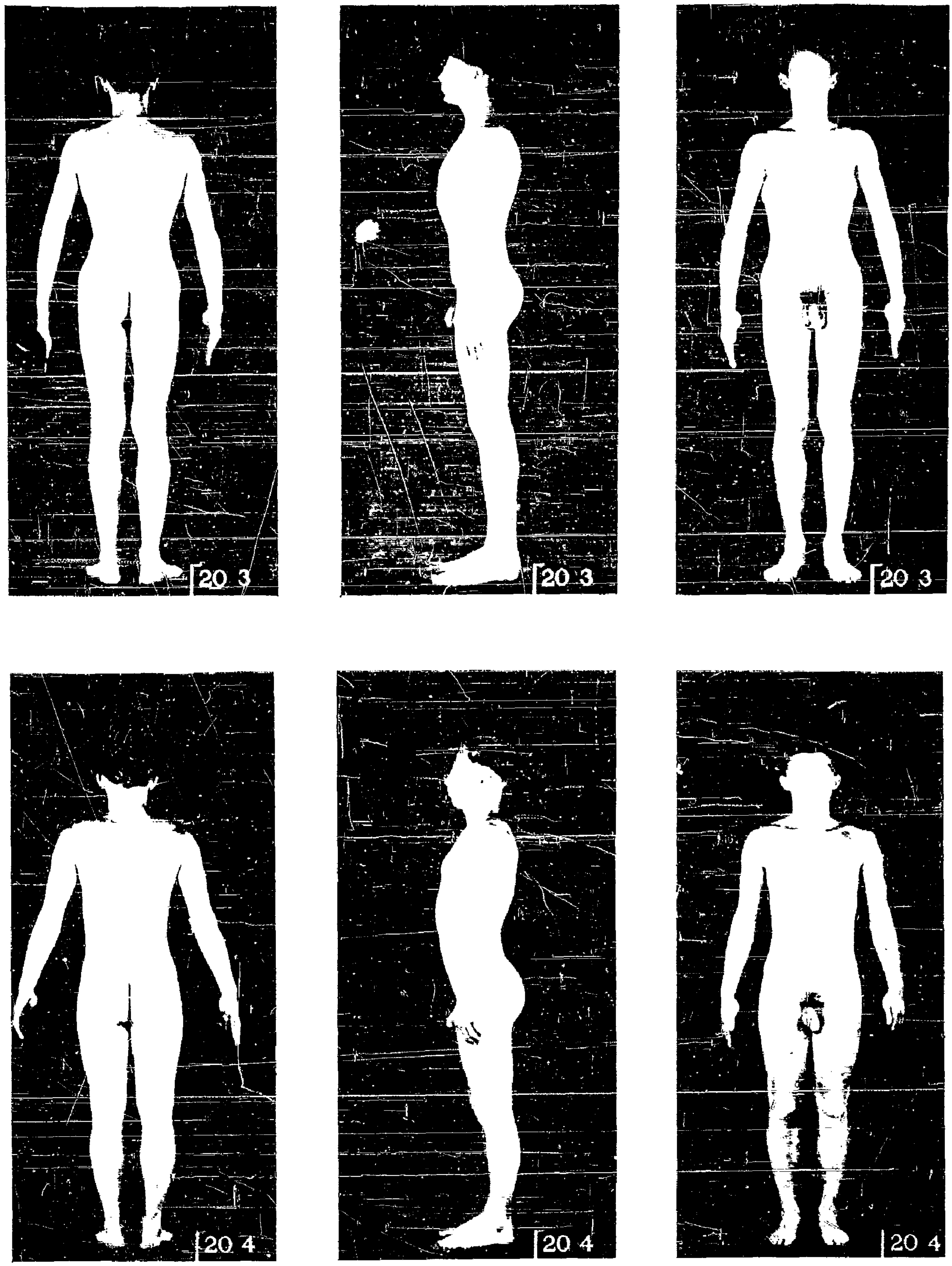


Figure F-24. Group 20 (subjects 3 and 4)

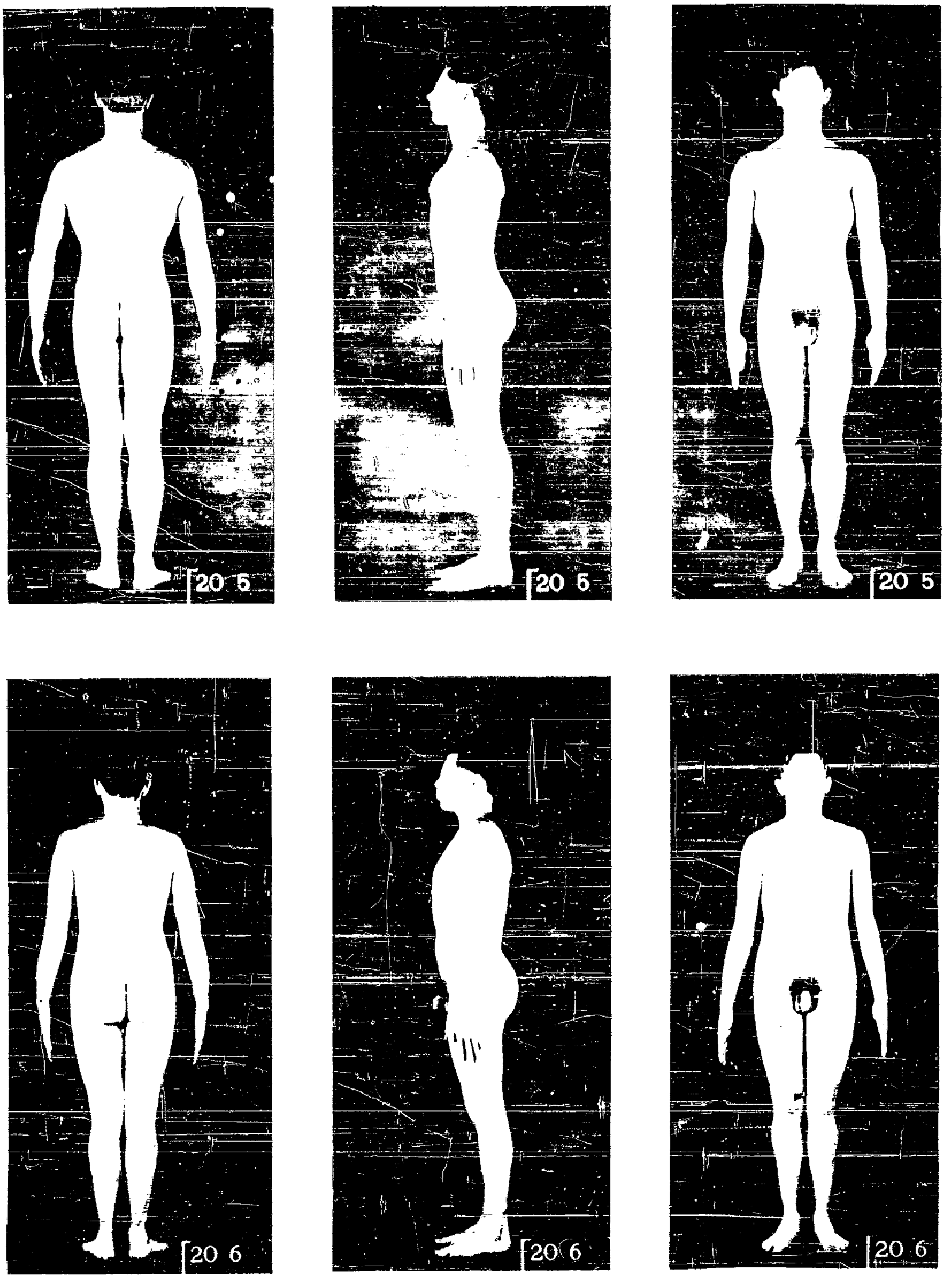


Figure F-24. Group 20 (subjects 5 and 6)

Figure F-25. Group 99 (subject 1)

Table F-7

Summary of Variables for Anthropometric Study With Their Means and Standard Deviations
Population = 108

Variable No.	Description of Variable	Unit of Measurement	Mean	Standard Deviation
01	Chest Circumference	Centimeters	87.481	± 5.238
02	Calf Circumference	Centimeters	35.139	± 2.075
03	Face Breadth	Centimeters	13.662	± 5.470
04	Hand Length	Centimeters	19.188	± 9.015
05	Hand Breadth	Centimeters	8.632	± 4.392
06	No. of Disproportions	Number Observed	3.093	± 2.386
07	Hand Area	Square Centimeters	165.380	±14.270
08	Region #1 (head and neck) - Somatotype A	7-Point Scale	2.537	± 0.686
09	Region #1 (head and neck) - Somatotype B	7-Point Scale	4.972	± 0.986
10	Region #1 (head and neck) - Somatotype C	7-Point Scale	3.037	± 1.162
11	Region #2 (thoracic trunk) - Somatotype A	7-Point Scale	2.407	± 0.770
12	Region #2 (thoracic trunk) - Somatotype B	7-Point Scale	4.731	± 1.222
13	Region #2 (thoracic trunk) - Somatotype C	7-Point Scale	3.287	± 1.347
14	Region #3 (arms and hands) - Somatotype A	7-Point Scale	2.361	± 0.713
15	Region #3 (arms and hands) - Somatotype B	7-Point Scale	4.787	± 1.106
16	Region #3 (arms and hands) - Somatotype C	7-Point Scale	3.315	± 1.222
17	Region #4 (abdominal trunk) - Somatotype A	7-Point Scale	2.593	± 0.903
18	Region #4 (abdominal trunk) - Somatotype B	7-Point Scale	4.481	± 1.198
19	Region #4 (abdominal trunk) - Somatotype C	7-Point Scale	3.398	± 1.420
20	Region #5 (legs and feet) - Somatotype A	7-Point Scale	2.398	± 0.781
21	Region #5 (legs and feet) - Somatotype B	7-Point Scale	4.769	± 1.085
22	Region #5 (legs and feet) - Somatotype C	7-Point Scale	3.491	± 1.266
23	Somatotype A	7-Point Scale	2.444	± 0.711
24	Somatotype B	7-Point Scale	4.731	± 1.024
25	Somatotype C	7-Point Scale	3.352	± 1.173
26	Dysplasia	Number Observed	5.269	± 1.334
27	Masculine Component	4-Point Scale	3.963	± 0.270
28	Weight	Centimeters	152.148	±19.563
29	Stature	Weight in Pounds	174.454	± 6.935
30	Biacromial	Centimeters	39.343	± 1.973
31	Chest Breadth	Centimeters	28.302	±18.232
32	Chest Depth	Centimeters	20.694	±14.124
33	Bi-iliac	Centimeters	27.867	±14.877
34	Head Circumference	Centimeters	56.033	±14.475
35	Masculinity Estimation	4-Point Scale	3.833	± 0.553
36	Age	Months	223.056	± 1.797

Table F-8

Intercorrelations and Residuals of Variables from Anthropometric Stud
Population = 108; Significance Levels: P = 0.05, $|r| \geq 0.19$; P = 0.01, $|r|$

Residuals

Intercorrelations

Variable No.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
01		-.07	.03	.02	.00	-.02	-.03	.00	.01	-.03	-.01	.00	-.07	.03	-.07	.03	.06	-.01	-.12	-.03	-.03	-.03	.04
02	.72		.00	.02	.03	.03	.01	-.07	-.05	.06	-.01	-.07	.04	-.02	.01	.03	.06	-.04	-.12	.03	.01	-.05	.00
03	.57	.48		.01	.07	.02	.00	-.02	.08	-.11	-.02	.07	-.11	.05	.05	-.03	-.01	.09	-.07	.00	.02	-.07	-.03
04	.40	.24	.26		.09	-.03	.19	.03	.11	-.05	.04	-.04	-.01	.02	-.03	.02	-.02	.01	-.03	-.03	-.06	.00	.01
05	.53	.47	.51	.57		.02	.12	.01	.00	.01	.02	-.02	-.03	.00	-.09	.03	.05	.01	-.09	-.04	-.03	.02	.04
06	-.73	-.60	-.28	-.05	-.21		.00	.00	.06	-.06	-.01	.07	.05	-.01	.08	-.05	-.03	.02	.01	.01	-.03	.06	-.02
07	.53	.41	.44	.88	.70	-.15		.01	.05	-.04	.03	-.03	-.03	.03	-.08	.02	.02	.01	-.04	-.05	-.06	-.01	.04
08	.40	.25	.29	.13	.19	-.23	.19		-.05	-.03	.00	.03	-.02	-.06	.04	.01	.00	.13	.02	.00	-.03	-.01	-.01
09	.37	.35	.27	.08	.20	-.39	.15	.05		-.10	.00	-.12	.00	-.01	.00	.04	.01	.02	.00	.06	-.01	.01	-.03
10	-.49	-.41	-.32	.02	-.16	.49	-.08	-.27	-.81		.01	.05	.11	.02	-.01	.00	-.02	-.01	.03	-.02	-.01	.03	.03
11	.39	.34	.29	.04	.19	-.35	.14	.57	.22	-.36		-.03	-.07	-.01	.04	.03	.02	.10	-.01	-.01	.04	-.01	.02
12	.44	.41	.30	-.07	.25	-.45	.11	.10	.74	-.75	.18		.00	.03	-.08	.10	.09	-.07	.04	.06	-.06	.11	.04
13	-.56	-.45	-.38	-.01	-.31	.52	-.19	-.29	-.69	.83	-.46	-.81		-.04	-.04	.04	-.05	-.02	.09	-.04	-.02	.01	-.06
14	.50	.40	.33	-.03	.13	-.38	.06	.44	.13	-.33	.54	.22	-.41		-.10	.02	.08	-.05	-.04	.08	-.04	.01	.02
15	.38	.44	.29	-.03	.23	-.44	.12	.15	.71	-.71	.29	.79	-.77	.13		-.02	-.02	.02	-.01	.01	.09	-.02	.02
16	-.50	-.50	-.35	.08	-.30	.52	-.14	-.30	-.62	.74	-.44	-.72	.84	-.45	-.81		.01	.04	.02	-.02	-.04	-.01	.04
17	.42	.37	.27	-.02	.16	-.28	.09	.61	.19	-.35	.68	.13	-.40	.65	.15	-.39		.09	-.08	.01	.05	-.04	-.01
18	.48	.45	.33	-.02	.28	-.46	.15	.16	.70	-.69	.23	.79	-.73	.17	.79	-.71	.14		-.11	.06	-.02	.08	.11
19	-.55	-.53	-.37	.10	-.27	.54	-.11	-.27	-.63	.72	-.44	-.73	.83	-.42	-.74	.82	-.44	-.84		.03	-.04	.04	-.07
20	.37	.36	.31	-.04	.12	-.37	.06	.50	.06	-.22	.55	.06	-.26	.61	.12	-.36	.56	.11	-.32		-.02	-.07	.06
21	.40	.52	.27	-.09	.24	-.46	.09	.03	.66	-.64	.18	.74	-.67	.16	.75	-.71	.13	.76	-.70	.04		-.02	.02
22	-.48	-.59	-.33	.16	-.22	.59	-.04	-.21	-.58	.67	-.34	-.60	.67	-.39	-.67	.75	-.30	-.65	.75	-.36	-.80		-.02
23	.53	.44	.33	-.01	.21	-.41	.13	.69	.11	-.32	.79	.15	-.43	.72	.19	-.44	.79	.18	-.47	.77	.13	-.40	
24	.45	.48	.28	-.02	.25	-.49	.13	.05	.85	-.78	.21	.85	-.76	.16	.82	-.72	.12	.85	-.76	.11	.83	-.71	.15
25	-.56	-.53	-.38	.05	-.28	.56	-.14	-.28	-.75	.85	-.46	-.78	.90	-.42	-.79	.89	-.41	-.78	.89	-.30	-.73	.79	-.44
26	-.09	-.03	-.02	-.02	-.04	-.02	-.02	-.01	.15	-.04	.05	.03	.02	-.19	.05	.03	.05	-.11	.14	-.18	-.05	.17	-.08
27	-.24	-.19	-.20	.02	-.05	.15	-.02	-.29	.14	.06	-.28	.08	.13	-.41	.04	.15	-.44	.11	.14	-.37	.10	.16	-.40
28	.84	.78	.64	.53	.64	-.52	.67	.41	.30	-.36	.41	.30	-.46	.39	.33	-.43	.43	.38	-.46	.37	.28	-.35	.49
29	.36	.30	.33	.72	.48	.05	.67	.11	-.08	.18	.00	-.20	.13	-.01	-.19	.20	.05	-.17	.22	.00	-.25	.29	.03
30	.48	.39	.38	.45	.39	-.10	.47	.19	.26	-.22	.13	.22	-.26	.14	.16	-.13	.16	.23	-.15	-.02	.10	-.02	.18
31	.85	.65	.56	.41	.55	-.67	.54	.26	.33	-.40	.33	.40	-.52	.36	.38	-.45	.27	.41	-.47	.27	.35	-.38	.39
32	.78	.56	.48	.25	.45	-.59	.40	.31	.29	-.38	.33	.41	-.49	.38	.34	-.45	.29	.40	-.02	.32	.35	-.43	.43
33	.37	.44	.37	.46	.41	.03	.49	.23	.02	.01	.10	-.03	-.01	.10	-.02	.04	.20	.02	.00	-.02	.01	.03	.16
34	.45	.31	.57	.29	.47	-.21	.43	.15	.19	-.13	.12	.21	-.26	.10	.28	-.21	.12	.28	-.26	.12	.21	-.21	.17
35	.02	-.03	.01	-.09	.01	-.06	-.04	-.13	.14	-.06	-.02	.07	.02	-.20	.06	-.03	-.16	.09	-.06	-.10	.03	.01	-.09
36	-.06	-.03	.09	-.15	-.12	.05	-.14	-.03	-.12	.15	.04	-.12	.12	-.01	-.06	.04	.00	-.12	.09	.07	-.07	.04	.04

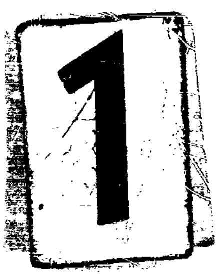


Table F-8

rrelations and Residuals of Variables from Anthropometric Study

= 108; Significance Levels: $P = 0.05$, $|r| \geq 0.19$; $P = 0.01$, $|r| \geq 0.25$

Residuals

13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	35	36
-.07	.03	-.07	.03	.06	-.01	-.12	-.03	-.03	-.03	.04	-.01	-.01	.06	-.02	-.10	-.15	-.02	.03	.18	-.15	-.01	.06	.06	.06
.04	-.02	.01	.03	.06	-.04	-.12	.03	.01	-.05	.00	-.02	.02	.10	-.03	.00	-.02	-.01	-.03	.00	.04	-.10	.01	.01	.02
-.11	.05	.05	-.03	-.01	.09	-.07	.00	.02	-.07	-.03	.09	-.06	-.05	-.08	.01	-.02	-.03	.05	.13	-.05	.02	.08	.08	-.05
-.01	.02	-.03	.02	-.02	.01	-.03	-.03	-.06	.00	.01	.02	.01	.00	.04	.08	.12	.05	.11	.05	-.04	.05	-.06	-.06	.02
-.03	.00	-.09	.03	.05	.01	-.09	-.04	-.03	.02	.04	.00	.01	.02	.03	.03	.04	-.08	.05	-.03	-.03	.04	.06	.06	-.02
.05	-.01	.08	-.05	-.03	.02	.01	.01	-.03	.06	-.02	.10	.02	-.07	.02	.01	.06	.10	-.08	-.16	.03	.01	-.05	-.05	-.01
-.03	.03	-.08	.02	.02	.01	-.04	-.05	-.06	-.01	.04	.01	.00	.01	.04	.01	.02	-.07	.07	.00	-.08	-.01	.02	.02	.04
-.02	-.06	.04	.01	.00	.13	.02	.00	-.03	-.01	-.01	.01	.00	-.02	.03	-.05	-.05	.01	.01	.04	-.04	.00	-.01	-.01	-.03
.00	-.01	.00	.04	.01	.02	.00	.06	-.01	.01	-.03	.03	-.05	.03	.02	.02	.05	.05	-.05	.13	-.08	.06	.05	.05	-.08
.11	.02	-.01	.00	-.02	-.01	.03	-.02	-.01	.03	.03	-.02	.10	-.03	.03	.02	.04	-.05	.05	-.10	.07	-.01	.00	.00	.08
-.07	-.01	.04	.03	.02	.10	-.01	-.01	.04	-.01	.02	.04	-.04	.01	.04	-.01	-.01	-.01	.04	.01	-.07	-.01	.10	.10	.01
.00	.03	-.08	.10	.00	-.07	.04	.06	-.06	.11	.04	-.09	.06	.00	-.04	-.05	-.04	-.02	-.11	.15	-.10	.01	-.05	-.05	-.06
	-.04	-.04	.04	-.05	-.02	.09	-.04	-.02	.01	-.06	-.01	.10	.00	.08	-.01	.05	-.02	-.03	-.17	.13	-.06	.06	.06	.05
.41		-.10	.02	.08	-.05	-.04	.08	-.04	.01	.02	-.01	.02	-.06	-.07	-.10	-.04	.02	.01	-.01	-.06	-.04	-.10	-.10	-.01
.77	.13		-.02	-.02	.02	-.01	.01	.09	-.02	.02	.03	-.01	.07	.00	-.04	-.05	-.07	-.11	.05	-.05	.07	-.02	-.02	.02
.84	-.45	-.81		.01	.04	.02	-.02	-.04	-.01	.04	.03	.02	-.04	.02	.05	.02	.09	.09	-.01	.09	.03	-.01	-.01	-.01
.40	.65	.15	-.39		.09	-.08	.01	.05	-.04	-.01	.03	-.05	-.01	-.10	.02	.01	.03	.04	.02	-.02	.03	-.03	-.03	-.03
.73	.17	.79	-.71	.14		-.11	.06	-.02	.08	.11	.02	.01	.05	.04	-.02	-.07	.02	-.10	.11	-.05	.00	.00	.00	-.02
.83	-.42	-.74	.82	-.44	-.84		.03	-.04	.04	-.07	-.04	.08	.08	.06	-.13	-.06	-.06	-.09	.13	-.06	.01	-.04	-.04	.05
.26	.61	.12	-.36	.56	.11	-.32		-.02	-.07	.06	.08	-.02	-.10	.00	-.03	.01	-.09	.02	.01	-.08	-.06	.04	.04	.04
.67	.16	.75	-.71	.13	.76	-.70	.04		-.02	.02	.02	-.01	.09	.03	-.09	-.12	-.07	-.05	.07	-.07	-.05	-.02	-.02	.02
.67	-.39	-.67	.75	-.30	-.65	.75	-.36	-.80		-.02	.03	.01	-.03	.07	.02	.01	.05	.00	-.02	-.01	.01	.00	.00	-.02
.43	.72	.19	-.44	.79	.18	-.47	.77	.13	-.40		.06	-.02	-.06	.05	-.04	-.01	.03	.07	.02	-.05	.03	.07	.07	.00
.7[illegible]	.16	.82	-.72	.12	.85	-.76	.11	.83	-.71	.15		-.03	.01	-.01	.00	-.02	-.01	-.08	.14	-.03	.03	.00	.00	-.04
.90	-.42	-.79	.89	-.41	-.78	.89	-.30	-.73	.79	-.44	-.82		-.06	.07	.03	.08	.03	.05	-.07	.09	.01	-.01	-.01	-.01
.02	-.19	.05	.03	.05	-.11	.14	-.18	-.05	.17	-.08	-.02	.03		-.08	.03	-.02	.02	.03	-.01	.03	-.03	-.08	-.08	.01
.13	-.41	.04	.15	-.44	.11	.14	-.37	.10	.16	-.40	.10	.16	.03		-.01	.02	.08	.01	.00	-.06	.02	.11	.11	.04
.46	.39	.33	-.43	.43	.38	-.46	.37	.28	-.35	.49	.34	-.46	-.10	-.25		-.01	.03	-.02	.06	-.11	-.01	.06	.06	.02
.13	-.01	-.19	.20	.05	-.17	.22	.00	-.25	.29	.03	-.19	.21	-.04	-.04	.62		.09	-.03	.05	-.10	.03	.03	.03	-.03
.26	.14	.16	-.13	.16	.23	-.15	-.02	.10	-.02	.18	.18	-.19	.08	.06	.62	.59		.07	-.06	.00	-.01	.07	.07	.05
.52	.36	.38	-.45	.27	.41	-.47	.27	.35	-.38	.39	.39	-.48	-.03	-.10	.79	.41	.58		.05	-.06	.00	.05	.05	-.01
.49	.38	.34	-.45	.29	.40	-.02	.32	.35	-.43	.43	.40	-.45	-.16	-.23	.68	.30	.28	.58		-.07	.05	.08	.08	-.07
.01	.10	-.02	.04	.20	.02	.00	-.02	.01	.03	.16	-.01	-.01	.05	-.14	.56	.62	.51	.40	.21		-.06	.04	.04	-.01
.26	.10	.28	-.21	.12	.28	-.26	.12	.21	-.21	.17	.19	-.23	-.06	-.02	.53	.37	.37	.48	.32	.31		-.01	-.01	.04
.02	-.20	.06	-.03	-.16	.09	-.06	-.10	.03	.01	-.09	.10	-.04	-.05	.21	-.01	.00	.06	.06	.01	.00	-.06			-.02
.12	-.01	-.06	.04	.00	-.12	.09	.07	-.07	.04	.04	-.15	.05	.19	.06	-.04	-.12	.06	-.01	-.12	-.03	.19	-.03	-.03	

2

Table F-9

Rotated Factor Loadings from Anthropometric Stuc

Population = 108

Variable No.	Description of Variable	Final Factors 1	2	3	4	5	6	7	8	9	h2*
01	Chest Circumference	.50	.28	.79	.06	.05	.04	.02	.09	-.05	0.97
02	Calf Circumference	.42	.07	.71	.00	.00	-.10	.16	.08	.05	0.73
03	Face Breadth	.37	.20	.38	.14	-.08	-.01	.04	.15	.44	0.57
04	Hand Length	.44	.50	-.02	.00	-.08	.04	.00	.29	-.14	0.56
05	Hand Breadth	.56	.19	.22	-.03	-.19	-.11	-.12	.49	.07	0.71
06	No. of Disproportions	-.11	.16	-.84	.10	-.17	-.31	-.10	-.19	.07	0.93
07	Hand Area	.57	.49	.12	.00	-.19	-.02	-.08	.59	-.03	0.97
08	Region #1 (head and neck) - Somatotype A	.17	.04	.34	.63	-.08	.01	.05	.02	.01	0.55
09	Region #1 (head and neck) - Somatotype B	.05	-.19	.53	-.22	-.62	.10	.18	.00	-.03	0.80
10	Region #1 (head and neck) - Somatotype C	-.05	.23	-.67	.04	.45	-.06	-.03	.07	.10	0.73
11	Region #2 (thoracic trunk) - Somatotype A	.14	-.15	.43	.62	-.14	.07	-.01	.05	.04	0.64
12	Region #2 (thoracic trunk) - Somatotype B	.08	-.22	.65	-.34	-.64	.03	-.02	-.01	-.02	1.00
13	Region #2 (thoracic trunk) - Somatotype C	-.12	.17	-.65	.00	.53	.03	.11	.02	.04	0.76
14	Region #3 (arms and hands) - Somatotype A	.17	-.14	.52	.49	.05	-.12	-.09	-.10	-.01	0.59
15	Region #3 (arms and hands) - Somatotype B	.09	-.20	.62	-.23	-.51	.05	-.20	.09	-.02	0.80
16	Region #3 (arms and hands) - Somatotype C	-.14	.31	-.73	-.04	.43	.07	.23	-.07	-.02	0.90
17	Region #4 (abdominal trunk) - Somatotype A	.13	-.10	.37	.71	-.15	.05	.06	-.04	.02	0.70
18	Region #4 (abdominal trunk) - Somatotype B	.03	-.07	.70	-.37	-.42	-.19	-.17	-.04	.02	0.88
19	Region #4 (abdominal trunk) - Somatotype C	.27	.07	-.76	-.07	.47	-.01	.21	-.11	-.15	0.96
20	Region #5 (legs and feet) - Somatotype A	.03	-.08	.45	.57	.17	.00	-.08	.18	.11	0.61
21	Region #5 (legs and feet) - Somatotype B	-.01	-.10	.64	-.30	-.42	-.33	.13	.09	.05	0.82
22	Region #5 (legs and feet) - Somatotype C	.03	.33	-.73	.08	.25	.40	-.04	-.12	-.06	0.89
23	Somatotype A	.19	-.18	.50	.80	.00	-.03	.04	.02	.03	0.96
24	Somatotype B	.01	-.20	.69	-.37	-.50	-.02	.09	.07	-.08	0.92
25	Somatotype C	-.09	.21	-.75	.01	.47	.12	.14	.00	-.01	0.87
26	Dyplasia	.06	-.11	-.20	.06	-.23	.41	.20	-.01	.17	0.35
27	Masculine Component	-.10	.04	-.18	-.42	-.18	.08	.10	-.04	.05	0.27
28	Weight	.65	.34	.65	.17	-.02	-.07	.02	.06	.07	1.00
29	Stature	.64	.65	.00	.04	.08	.06	.09	-.02	-.05	0.85
30	Biacromial	.56	.25	.20	-.03	-.18	.09	.02	.08	.11	0.48
31	Chest Breadth	.56	.15	.64	-.10	-.06	.11	-.10	-.01	.11	0.79
32	Chest Depth	.59	-.18	.42	.07	.12	-.19	-.06	.19	-.05	0.65
33	Bi-iliac	.61	.50	.11	.15	-.18	-.07	.16	-.09	.06	0.73
34	Head Circumference	.30	.29	.32	-.05	-.04	-.07	-.06	.15	.54	0.60
35	Masculinity Estimation	-.03	-.01	.00	-.19	-.08	.08	-.03	-.10	-.06	0.06
36	Age in Months	.05	-.17	-.09	.04	.04	.11	.06	-.15	.47	0.30

* h^2 = Communalities.

APPENDIX G

Table G-1 Summary of Subject Attrition for the Individual Area Studies

Table G-1

Summary of Subject Attrition for the Individual Area Studies

Group No.	Subject No.	Physical Fitness Study. Population = 109	Ketosteroid Study. Population = 85	Personality and Aptitude Test Study. Population = 111	Personal Interview Study. Population = 119	Rorschach (K) Study. Population = 119	Rorschach (S) Study. Population = 119	Anthropometric Study. Population = 108	Physical Characteristics Study. Population = 105	Blood Count Study No. 1. Population = 91	Blood Count Study No. 2. Population = 92	Blood Count Study No. 3. Population = 94	Blood Count Study No. 4. Population = 93	Blood Count Study No. 5. Population = 93
01	1	Dropped	Dropped					Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
01	2	Dropped	Dropped					Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
01	3	Dropped	Dropped	Dropped				Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
01	4	Dropped	Dropped					Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
01	5	Dropped	Dropped					Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
01	6	Dropped	Dropped					Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
02	1		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
02	2		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
02	3		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
02	4		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
02	5		Dropped	Dropped				Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
02	6		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
03	1		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
03	2		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
03	3		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
03	4		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
03	5		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
03	6		Dropped							Dropped	Dropped	Dropped	Dropped	Dropped
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04	2													
04	3													
04	4		Dropped											
04	5													
04	6													
05	1													
05	2	Dropped												
05	3	Dropped	Dropped					Dropped		Dropped	Dropped	Dropped	Dropped	Dropped
05	4													
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11	4		Dropped	Dropped					Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
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14	1													
14	2													
14	3	Dropped	Dropped	Dropped		Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
14	4													
14	5		Dropped											
14	6									Dropped	Dropped		Dropped	Dropped
15	1			Dropped										
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16	2													
16	3			Dropped										
16	4													
16	5													
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17	2													
17	3								Dropped					
17	4													
17	5													
17	6		Dropped						Dropped					
18	1							Dropped		Dropped	Dropped		Dropped	Dropped
18	2	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
18	3													
18	4													
18	5													
18	6													
19	1													
19	2													
19	3		Dropped											
19	4	Dropped	Dropped	Dropped				Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped
19	5													
19	6													
20	1													
20	2													
20	3									Dropped	Dropped	Dropped	Dropped	Dropped
20	4													
20	5									Dropped		Dropped		
20	6													
*99	1	Dropped	Dropped	Dropped	Dropped			Dropped	Dropped	Dropped	Dropped	Dropped	Dropped	Dropped

*Eliminated from Submarine Service for gynecomastia.

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Lib MedBr Univ of Texas Galveston
Lib MedCen Jersey City NJ
Lib College of Physicians of Phila
Lib Univ of Kansas MedCen Kansas City Kan
Stimson Lib Army MedSerSch Brooke Army MedCen Ft Sam Houston
Def Rsch Member Canadian JtStaff Wash
CO NavDenSch (Lib) NNMC Bethesda
CO USAMedUnit Ft Detrick Md
QM Gen USA Wash
CG USA ChemCorp R&D Cmd Wash
ChRschDev (Human Factors RschDiv) Dept of Army Wash
ChRschDev (Life SciDiv) Dept of Army Wash
CO USA Chem R&D Lab Army ChemCen Md
Gift & Exchange Dept Univ of Minn Lib Minneapolis
Welch MedLib John Hopkins Univ Balto
NY AcadMed Lib NYC
Head Psychol Br Neuropsychiatric Ser USNH Oakland Calif
Francis C Stevens Danielson Conn
CO NavOrd Test Sta (3045) China Lake Calif
Head BibliogSec SciTechDiv LibCong Wash
Lib Sapporo Univ of Med Sapporo Japan
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All India Inst Hygiene & Pub Health Calcutta India
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A FACTOR ANALYSIS OF PERSONNEL SELECTION DATA: Intra- and Inter-Area Relationships of Biochemical, Physiological, Psychological and Anthropometric Measures
By ELLSWORTH B. COOK, CDR MSC USN

Vol. XI, No. 26 December 1961

Tests used in routine screening, together with special additional measures, were administered to 120 randomly selected enlisted submarine candidates under carefully controlled conditions. The 362 variables included data from the biochemical, psychological, psychiatric, physiological, anthropometrical, and physical examination fields. In order to render the data manageable, they were divided into a number of sub-studies and factors analyzed by the Thurstone Group Centroid method. Selected factors from each sub-study were then combined to determine inter-area relationships. As the end product of the elaborate statistical analysis, seven factors were extracted which explained more than 90 per cent of the total variance. Two of these were related to the reaction of 17-ketosteroids during stressful situations, and another was designated as a size-strength factor with masculinity overtones. The cluster of loadings on one extracted factor was suggestive of the type of individual who thinks with his heart rather than his head while loadings on another factor were considered characteristic of the person who thinks with his head rather than his heart. Still another factor was designated as orientation in environment. Finally, there was a poorly defined factor vaguely suggestive of hormonal response.

A replication on another population is, of course, necessary before estimates are possible regarding the effectiveness of any of the factors in predicting successful performance

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Data for the various area studies are appended in sufficient detail to permit additional investigations by interested specialists. These include material on the biochemistry of nervous stability; corelational relationships of the various white blood cells in healthy male adults; physical fitness, anthropometric and somatotyping measures; two independent scorings of the Rorschach inkblot test; personal interviews given each subject separately by two interviewers, and several psychological tests employed in selection.

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